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REGIUS PROFESSOR OF PHYSIC IN THE UNIVERSITY OF CAMBRIDGE; CONSULTING PHYSICIAN TO GUY'S HOSPITAL

AN upheaval in human as in terrestrial affairs is succeeded inevitably by a phase of subsidence and this, in turn, by a period of new growth and reconstruction. Out of disruption a better organisation is often born than that which went before. War-preparations and, in particular, the need for an emergency hospital service to meet heavy air-raid casualties have, in these early stages of conflict, scattered our metropolitan hospitals and schools, their students and their teaching staffs. Now that the casualties have not been forthcoming we are experiencing the flat and uncomfortable phase of subsidence, pausing to take stock, hesitating, and wisely so, before returning to our old haunts and our old ways. We may have to face upheavals far more serious before the war is over, but even if we do return in time to our old haunts it would be a thousand pities if we were willing to return to all our old ways. It is, in fact, very doubtful whether the changed economic situation will ever allow the older systems to be re-created. Hospitals and their staffs will both have to discover new sources of income and support. Intimately bound up with these difficulties is the important, and nationally important, problem of clinical education. How hereafter shall it be served and better served than heretofore? An answer to this question must be found, for upon the wisdom or otherwise of our decisions will depend the future ascendancy or further decline of a system of teaching with great traditions, of a system which was once, but is now less certainly the main-spring of all that is best in British medicine.

The special commissioner of THE LANCET in his "Plan for British Hospitals" and the numerous correspondents whom he stimulated or provoked have written, for the most part, from the point of view of the hospitals and the consultants rather than from that of the students and the schools. The survival and the efficiency of the hospitals, the consultants, and the schools are indissolubly linked and cannot be separately considered. The suggestions which follow are in the nature of an appeal for such consideration.

CAUSES OF THE DECLINE OF TEACHING

With the statement that a decline in the standards of clinical teaching was already in process before the present crisis there can, I believe, be no honest dispute. The causes for this decline are not far to seek. It has been due in general to the combined effects of existing social systems and existing economic and scientific trends. The several causes are to be found, in the first place, in the rapid advance of scientific knowledge, the rapid development of accessory methods of diagnosis, the multiplication without integration of the subjects required in the medical curriculum, and the inevitable specialistic evolution of the clinical teacher himself. They are to be found, in the second place, in the divided interests of the clinical teacher, whose livelihood has generally depended upon practice and whose success in practice, under stress of increasing competition, has compelled him to give more time and thought, as a rule, to his own interests than to those of his students. There is not one among us, however conscientious and devoted to hospital duties, who has not experienced the uncomfortable stress of teaching "against the clock," of arriving on occasion late for a round or even sometimes of having to cancel a round because of the claims of private practice. It is perfectly true that these claims have often been urgent and humanitarian and not infrequently unremunerative, but for the harassed mind they have provided an additional conflict and for the student and the hospital patient they have been a disadvantage. There is not one among us who has not, or should not have, regretted that he enjoyed so little real freedom for the work of the ward, such scant time for the preparation of his lectures, and such limited opportunity for getting to know his hospital patients, his house-men, his clerks or his dressers. Many of us have had difficulty even in memorising the names of the students composing our rapidly changing firms, an admission which would not be necessary could we spend with them the time due from any other kind of teacher to his class. With the growth of practice and responsibilities most of us have found occasion for wistful retrospect to those younger days of institutional life, or, perhaps, of hospital service in the last war, to days spent in the midst of problems and eager discussion among colleagues, when we were salaried and poor and extravagant living was not the enforced convention which it later became. As teacher-consultants we have had to provide for high rents and life insurance, education fees, the car, the secretary, and the country cottage for the preservation of health and sanity. The more successful have become driven, the less successful anxious or disappointed men.

Add to all this the mental and physical fatigue of serving many masters; the medical societies, the committees, the papers to be written, and the provincial lectures; the time and energy commonly expended by the younger consultants on several hospitals with a view to increasing their experience and their clientele; the failure, as the years slip by, to keep adequately abreast with one's subject and still more with correlated subjects and general cultural needs; and surely no doubt can then remain in the mind that clinical teaching, which should be our first and highest office, try as we would, has not been adequately or whole-heartedly served in any of our schools in any part of the last quarter of a century.

It has been argued with some justice that specialisation has at least benefited the patient, if not always the pregraduate student, but through whom other than the student are the majority of patients ultimately benefited? It may reasonably be claimed that the patient under the care of the specialist physician or surgeon today receives a better measure of skill and care than he did in an earlier generation, but contact with examinees and younger practitioners leaves us wondering how we are to recall the clinical wisdom and influence of an earlier and more inspiring age of less specialised teachers; how we are to secure for our students a better general training in clinical method, a more logical approach to common problems, a sounder appreciation of the value of history, signs and symptoms and a better correlation of bedside medicine with physiology and the other ancillary sciences. It is also argued that the teacher-consultant has much to give his classes which the whole-time professor often fails to give. With this I am in full accord, but so long as professors are selected from men without experience of practice it cannot be other-

wise. Nevertheless, I would suggest that as he grows older the teacher-consultant often deteriorates rather than improves for the simple reason that his thought becomes sterilised by the distractions and fatigues of professional life, and by the lack of time for integrating his knowledge and adapting it to the particular needs of the student. Becoming stereotyped in his teaching he may even omit from it invaluable information bearing upon the training of clinical sense and the details of clinical management which are among the best fruits of his private professional experience.

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In contemplating reforms our concern must be (1) with the schools and their support, (2) with the teachers and the terms of their appointment, (3) with the students and their selection.

THE SCHOOLS

The medical schools should cease to be institutions to which men "go" to teach or to learn; they should be institutions in which they largely "reside" to teach or to learn. This need not be interpreted entirely literally, but it should at least be allowed that a much greater part of the teachers' and the students' time should be spent and commonly spent together in the wards, the outpatient clinics, the laboratories and the post-mortem room, and, last but not least, in the conferences of the tea-room or luncheon refectory. Colleagues must meet more and know each other better. The physician must be more often in the laboratory or the operating-theatre, the surgeon more often in the ward. Embarrassed by lengthening lists it is now by no means rare for surgeons to operate on cases not previously examined and discussed with their firms, sometimes even not previously seen but accepted on the basis of a diagnosis made in the X-ray department or elsewhere. Such action does not escape the comment of students. It would have been unthinkable in an earlier generation of surgeons. With the development of operative techniques diagnosis is now a waning art in the hands of many surgeons, and teaching and therapeutic judgment have appreciably suffered. It is generally accepted that the robed and towelled drama of the operating-theatre has small instructive value for the student audience. The value, on the other hand, of full discussion of a case before and after operation cannot be over-estimated. The physician, the pathologist, and the biochemist must share their problems more intimately and by personal contact in the ward, the laboratory, and the dead-house. The familiar bed-letter inscription: "Will Mr. So-and-So please see?" and "Will Dr. So-and-So kindly report on this specimen?" have become an accepted convention, but it is one which can only serve to fix in the student mind the fallacious idea that penny-in-the-slot methods can properly replace consultation. The teaching staff should have opportunities of closer and freer association with house-men and students when morning or afternoon sessions are finished. Informal visits with single students or small groups to discuss cases of particular difficulty or interest should sometimes supplement teaching rounds with the whole firm. There should be rounds for the students, rounds for the patients, and sometimes rounds for the nurses. The benefit alike to patient and physician of a solitary visit, without the attendant class, cannot be exaggerated, but how rarely is it possible under the existing order.

It is reported from some of the sectors that students have declared that they are receiving better clinical teaching than under peace-time conditions in the parent hospital. This prompts two reflections. First, if better teaching can be supplied with the make-shift provisions of a sector hospital in its first few months, then there is clearly something wrong with the teaching arrangements in normal times. Secondly, the advantages which these students are discovering must surely be due in large part to their much closer associations with their teachers and the patients and to the general influences of the institutional life.

How much of the clinical achievement of men like Bright, Addison, Gull, Wilks, and Fagge depended upon the long hours which they devoted to the ward and the post-mortem examination? The car and the telephone have made it possible for us to diffuse our energies over a wide area of town and country in a small space of time, but better work must inevitably be done when there is less diffusion and when energies are conserved for the plentiful problems which the teaching hospital attracts and stages.

The hospital as a college and a community with the patients even more the centre of interest and attention and sympathy than they are at present is surely the ultimate ideal. It should be more honourable to be referred to as "the Staff" than as "the Visiting Staff." We should not wish to be visitors in our own home. In such a community we should learn to probe the minds and difficulties of our students and to appraise and advise them as individuals, while the pride of firm would still remain and even become intensified. As teachers we should become less aloof and didactic, and enjoy and profit by our teaching more. There would be more frank and logical debate over our cases and less anecdote. Contacts between teaching and research would also be more feasible. The Hippocratic ideal and the Harveian method could be nurtured side by side. The relations of the preclinical to the clinical subjects could be more frequently emphasised and illustrated. The spirit of service and the spirit of inquiry would come to drive in harness together. But how, it will be asked, are the time and the teachers to be found for so utopian a scheme? And how is it to be financed?

THE TEACHERS

We must presuppose that Government aid for the hospitals and increased Government grants for the universities and schools will be forthcoming. A nation which can spend six million pounds a day on defence and destruction in war-time ought to discover in times of peace some means of contributing a like or lesser sum annually to ensure the solvency and progressive activity of its teaching hospitals, the treatment of their sick, the training of good doctors and nurses, and the

advancement of medical education and research. In many countries such provisions are already the concern of the state. Visualising a long war and general impoverishment our schemes for the future must be reasonable and not lavish and well calculated to deserve the respect of the public and of Parliament. And surely if state aid for the medical services as a whole is to be envisaged the teaching hospitals, after the public health, should have a first claim upon the country's exchequer. For the schools set the standards and provide the training, not only of the students, but also of the physicians, surgeons, obstetricians, pathologists, and other specialists from whom the whole medical provisions and health instruction of the state and the individual ultimately derive. I am glad that so great an authority as Sir Frederick Menzies should recently have emphasised this belief.

The Emergency Medical Service and the readjustments which it has already found necessary have indicated a possible thin end to the evolutionary wedge where the future security of the teacher is concerned. I would suggest that in our reorganised community every full member of a hospital teaching staff having charge of beds or an outpatient clinic or both should receive in respect of his work for the sick community (as the Emergency Medical Service now offers) a stipend of £500 per annum from the state. In return for this he should give not less than a full half of his working life, or the equivalent of three whole or six half days per week, to his hospital, devoting that time to the care of the sick, the investigation of disease, and to teaching. All staff appointments should be for five years only in the first instance. With these and certain other changes to be indicated smaller full staffs and certainly smaller junior staffs than obtain at present should be found adequate. Of late years there has been a tendency to the multiplication both of staff and junior staff appointments. Medical and surgical registrars and first assistants have taken over work which used to be performed by assistant physicians and surgeons. For them, no doubt, it has provided valuable opportunity, but from the assistant physician and surgeon it has withdrawn opportunity, relieving them of some of their outpatient, emergency, and night work, and simultaneously of the experience and educational contributions associated with such work, loosening bonds which formerly connected them with the hospital and their firms, and sometimes in the process depriving patients of the more mature judgment and skill which is their due.

In addition to the Government stipend an honorarium of £100 per annum in respect of tutorial work and lectures might be contributed from school or university funds. With these emoluments the younger men would embark on their careers in consulting or specialist medicine and surgery without the anxiety and embarrassment which now so frequently mar their earlier years. The whole of the teacher-consultant fraternity would have their duty to their hospitals more clearly prescribed and rewarded, and would be better content with such additional income as they would be free to secure in their private time. As important members of the public-health services they deserve recognition, and should not be so constantly compelled to count the time which can be spared from public duty for competitive practice or vice versa. A further assistance in respect of both time and monetary outlay could be secured for them by the provision of consulting rooms at a small rental in the private wings of the hospital. I understand that an experiment in this direction has already been instituted. By this means (excluding the time required for consultations at a distance) the greater part of the working week of the whole teaching staff would be spent within the hospital, and much time now wasted in travelling would be saved. The advantage to private patients of sharing the X-ray and laboratory services of the hospital at reasonable but economic charges would be manifest, and private and hospital patients alike would come to feel an interest and a pride in a community actively working on their behalf and to prefer its efficiencies to the spurious sanctity of the Harley Street consulting-room.

In addition, however, to these part-time appointments there should be whole-time directors of the medical, surgical, and obstetric services of the hospitals. These directors should be selected from among men of mature experience, who would be prepared to devote their later years to teaching and the organisation of teaching. In most of the schools men of appropriate type and calibre are either to be found or will in future be trained. A desire for whole-time institutional work is already being voiced in the oncoming generation of physicians and surgeons. I suggest that these directors should generally be selected for other qualities than those which determine the appointment of the younger directors of the existing medical units. These men owe their position to their abilities or promise as research workers rather than to long clinical training or teaching experience. The director of a service or department should generally be a man between 40 and 50 years of age, who has served his apprenticeship both in teaching and practice; who has gained familiarity with the problems of practice, with the needs of the general practitioner, and with many varieties and stages of disease which are but rarely encountered in hospital wards; and, finally, who has not yet lost interest and energy through the heavy demands of practice and affairs.

William Heberden, quoting Plutarch's statement that the life of a Vestal virgin was divided into three portions, in the first of which she learned the duties of her profession, in the second she practised them, and in the third she taught them to others, remarked, "This is no bad model for the life of a physician." With the two first portions completed there must be those among us who would be willing, even eager, to devote the last fifteen or twenty years of an active professional life to the interests of their students and their schools, and to the advancement of clinical teaching. A director of the type which I have in mind would have earned the respect of his colleagues and the right to guide the educational policy of the department as a whole. His nomination for election would be largely in their hands. He would help to relieve the dean of the school of organisation commonly quite outside his interest and scope, and to maintain a close liaison between the staff serving the department and the governing bodies of the school and hospital. The appointment of young research professors should not be discontinued, but the chairs should be supernumerary, and should only be filled when able and appropriate men are forthcoming. The appointments should be in the hands of the Medical Research Council rather than of the universities or schools. Their holders need not be debarred altogether from teaching, but they should be relieved of routine teaching and its organisation. They might with mutual profit to themselves and the school hold their chairs and their beds at a teaching hospital, although they would not necessarily do so.

The directors of medical, surgical, and obstetric services should, like the other members of the staff, receive £500 per annum from the state in return for their work as hospital servants. Their emoluments

should be raised to a figure of between £1300 and £1500 per annum from university and school funds. It is highly doubtful whether the professorial stipends of £2000 a year and over which are now available for the heads of the units will be possible after the war. The whole-time director, relieved entirely of practice, would spend the greater part of his days within the hospital precincts. His opportunities as "the chief" of his service for influencing educational policies, securing a balance between general and specialist teaching, and helping individual careers would be a large part of his reward. He should be entitled to more beds than the part-time staff, and would be better able to maintain his particular clinical interests, to arrange useful lecture programmes, and to contribute to and keep pace with the literature of his subject than he was as a teacher-consultant. He would be a very busy man, but his energies would not be dissipated in space and time; his life would be both simpler and more complete, and his expenses would be appreciably diminished.

Although Government representation on electoral boards might be stipulated, the appointment of staff, both whole- and part-time, should remain in the hands of the school and the university, the university having a voice especially in the election of the whole-time directors. In this way the bogy of bureaucratic interference in the internal affairs of the schools would be avoided, academic liberty would be retained, and, while their service to the public would properly become a paid contribution to the medical needs of the community, the educational functions of a hospital staff would, as properly, remain under the general guidance of school and university committees. The state would only render its contribution in the academic field through the medium of the university grants which cannot hitherto be said to have had anything but a beneficial influence. That medicine, with all its intimate bearings on national health and welfare and the cure and prevention of disease, and thereby on national economy, should have a first claim upon such grants would again seem difficult to dispute. Unless, however, the medical faculties first show themselves worthy of assistance by dint of some such reforms as are here outlined, no government would feel justified in giving them preference over other university faculties.

THE STUDENTS

At present the entries to all the schools are maintained at too high a level, and entries into the profession are reaching saturation point. With a falling population and the needs of all the Dominions now served by their own schools and universities our aim should be to train fewer doctors, but both to select and train them better. After the economic crisis of 1930–31 the entries to the medical schools of the British Isles rose abruptly, and the curve has shown no considerable decline in any subsequent year. It has been determined not by a wave of vocational enthusiasm, nor by any serious existing shortage of medical men and women. It is to be traced chiefly to economic factors. Of all the professions medicine should surely be the first to be recruited on a vocational basis. Humane service and scientific interest should provide the stimulus, not economic advantage or necessity. Since the last war we have also witnessed a conspicuous increase in the commercial outlook of doctors in all branches of the profession and a sensible waning of ethical standards. If we are to maintain and advance the old ideals of medical practice our young men and women must be encouraged to turn to medicine as a vocation and not in anticipation of any considerable profit or improvement in social status. The whole of our teaching and example must be so ordered as to preserve in their minds the predominant idea of a life of humane and scientific action in return for a reasonable living wage.

It will be objected that with a fall in entries the medical schools will suffer a serious loss of revenue. It has always seemed to me very wrong that the deans should have had to provide for the expenses and needs of the schools by packing their entries, overcrowding their classes, and overworking their preclinical teachers. The remedies must include both subsidy and economic planning, but the existing state of affairs ought not to continue and it is quite unlikely that post-war conditions will allow it to do so. If the Scandinavian countries can provide cheap or free medical education and simultaneously raise their standards of teaching, research and practice to a level which commands the admiration of the rest of the world there can be no valid reason why we should not do the same. It is true that their society is less complicated and capitalistic than ours and that they have not been burdened with our vast expenditure on armaments, but it is from a saving on such expenditure that we ultimately hope to build our improved social, educational, and health services. In the matter of students we should at least feel a right to require quality rather than quantity, and the selection of appropriate types may even become an object for careful study among the deans and directors of our reconstituted schools.

SUMMARY

What I have written must be regarded as little more than a brief sketch of possible reforms. It is intended to promote discussion, perhaps even to pave the way for actual planning. In brief, I suggest that we should begin to look forward to medical schools with smaller and more devoted staffs and fewer and more carefully chosen students; to an equitable combination of whole-time and part-time teaching; to hospitals and staffs in receipt of such support as the state ought to provide; but to staffs and students alike with modified and less personal ambitions and better defined ideals, prepared to accept, in return for humbler material benefits, the rich rewards of a more fraternal and more collegiate existence and of opportunities for teaching and research and their advancement which the present system denies or hampers, while making but little contribution to individual contentment. There is no higher mission than teaching and no one more deserving of time and patience and forethought than the student.

If we are entering this war with good intentions and for a great ideal, the ideal of human liberty, we should see to it that we emerge from it with intentions and ideals at least as good and great. The watchword for our actions then as now should be Service, and for that service we should expect no greater return than a living wage proportionate to the mode of life which the work requires and with the necessary assurances for the health and schooling of our children. Why, in fact, given the necessary adjustments for professional expenditure, should we ask more than our distinguished scientific colleagues engaged in physiological or pathological teaching and research, or more than a university professor?

I do not for a moment belittle the heavy expenditure in years and money which at present precedes qualification, or the struggles incidental to the consultant's life, or the long years that must often pass before he begins to feel a reasonable sense of security. Nor do I write without experience at first hand. But

our values have been all wrong and the public's values have been all wrong, and we have hitherto made no attempt to correct them. We are all going to be poorer after this war and very likely happier in the process. The last war saw the disappearance of the top-hat and the tail-coat. This one may well see the disappearance of the west-end consulting-room, the luxury car and the country cottage, but if in their place the genuine things of medicine come back into their own, and teaching, practice and research find new inspiration and better hospitals and schools to give them being, we shall not, I believe, regret the change or the material sacrifice.

Whatever form of social reorganisation awaits us, the common weal and not self interest must henceforward be uppermost in our thoughts. Less criticism of colleagues, less jealousy, and a restoration of languishing ethical codes should be mingled with our good resolutions. "Where there is love of man there also is love of the art," said Hippocrates. Both loves have suffered somewhat in a sick world. Let us hope that their revival will be a main feature of our contribution to peace and reconstruction. And finally, with the ability of the schools to proceed "under their own steam" already in jeopardy should we not at once give practical consideration to the forms which state aid might take and to the best manner of its administration?

TESTOSTERONE PROPIONATE

AND THE VASOMOTOR PHENOMENA OF GONADAL DEFICIENCY

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It has long been recognised that disturbances of the vasomotor system may follow diminished activity or removal of the gonads in man. In the female the menopause is usually associated with certain symptoms, of which the hot flush is the most characteristic, and the same symptoms develop at an earlier age after surgical removal of the ovaries. It is also generally accepted that these vasomotor phenomena in women can be abolished by suitable treatment with the œstrogens. In the male flushes may follow removal of the testes and can be abolished in a similar manner by treatment with the androgens. Although these facts are clear, the mechanism by which vasomotor phenomena are produced is still obscure. Albright (1936) suggested three possibilities: a simple lack of sex hormone; an overproduction of gonadotrophic hormone from the anterior pituitary; and the presence of some unknown factor normally kept in check by the sex hormones.

Work on the causation of flushes due to sex-gland deficiency has been handicapped by the failure to observe similar symptoms in the experimental animal. Zuckerman (1939) has not noticed any such symptoms in castrated monkeys; and, although flushing may be observed objectively in man, attention is usually first directed to the disturbance by the patient. In the course of other observations, in which large doses of testosterone propionate were used, it was found that flushes were produced in both sexes, and the purpose of this paper is to report these results and to discuss their relationship to the causation of the vasomotor phenomena of gonadal deficiency.

EFFECTS OF INJECTION OF TESTOSTERONE PROPIONATE

Males with normal gonads.—The injection of large doses of testosterone propionate into 2 males with normal gonads caused flushes. The injection of œstrogens stopped the flushes produced by testosterone propionate.

Case 1.—A man, aged 53, with an enlarged prostate. The full case-history and observations on the effect of testosterone propionate on the histology of the prostate have been given in a previous communication (Sharpey-Schafer and Shackman 1939). Apart from the prostate the gonads were normal, and there was no evidence of abnormal function of the other endocrine glands. The patient was moderately active sexually and had never had flushes. From Oct. 18 to Nov. 20, 1938, testosterone propionate 100 mg. in sesame oil was injected intramuscularly daily—3400 mg. over thirty-four days.

About a week after the start of the injections the patient complained of flushes; but, since at first their significance was not realised, records of the daily number of flushes were not kept. From then on he continued to have flushes, three to four in the twenty-four hours and rather more frequently at night than in the day-time. The flushes lasted ten to twenty minutes and were most pronounced in the face and neck, but sometimes a feeling of heat spread over the whole body. The time of onset bore no constant relationship to the time of injection. On several occasions the flush was observed and, so far as was possible to determine, differed in no way from the flush of a menopausal woman. Other symptoms were very slight. Morning erections lasting five to ten minutes were noticed, but erections did not take place at other times of the day. There was no increase of sexual desire.

These observations are of some interest because much smaller doses of testosterone propionate—40 mg. three times a week—have had a very potent effect in eunuchs (Foss 1937). In our experience large doses of testosterone propionate may have little or no effect on erections or sexual desire when injected into men with normal testes.

After discharge from hospital the patient was not seen again until six months later, in July, 1939; he was then complaining of not feeling well. He had lost weight, was depressed, felt dizzy on occasions, and was afraid to cross the road. He said that the flushes had continued ever since he left hospital. A daily count of the flushes was kept for two weeks, and then 5 mg. of stilbœstrol was given three times a day by mouth for three weeks. At the end of this time no effect was observed on the number of flushes. Œstradiol benzoate 100,000 I.B.U. (10 mg.) in oil was then injected intramuscularly three times a week. At the end of two weeks the flush count was less, and at the end of three weeks flushes had practically ceased and there was much subjective improvement in the other symptoms.

Case 2.—A man, aged 28, complained of a subsidence of erection on attempting intercourse. Apart from complete transposition of the viscera, physical examination revealed nothing abnormal, and his condition was thought to be due to psychological difficulties. He had never had flushes.

It was considered justifiable to try the effect of testosterone propionate, and the results are shown in fig. 1. After the injection of testosterone propionate 100 mg. in 2 c.cm. of sesame oil three times a week the patient began to have flushes, which were similar to those experienced by case 1 and would come on at any time of the day or night. In the third week stilbœstrol 15 mg. was given daily by mouth, while the administration of testosterone propionate was continued. No definite effect on the number of flushes was observed; but, when œstradiol benzoate 100,000 I.B.U. was injected in a different site at the same time as the testosterone propionate, the flushes ceased. After six days without injection sesame oil 2 c.cm. was injected three times weekly as a control, and no flushes were produced.

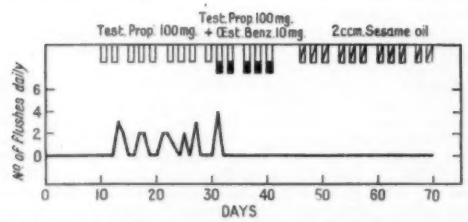

FIG. 1—Production of flushes by injection of testosterone propionate in a young adult man (case 2).

Females with functioning gonads.—The injection of testosterone propionate into 2 menstruating females produced flushes.

CASE 3.—A woman, aged 36, had a recurrent subarachnoid hæmorrhage from a blood-vessel tumour of the left parietal region. Menstruation had always been regular and normal, and there was no disorder of any of the endocrine glands. There were no signs of increased intracranial pressure. She had never had flushes.

During convalescence from an attack of subarachnoid hæmorrhage testosterone propionate 100 mg. was injected every other day (fig. 2). After a week she began to have flushes, which increased in number up to six or nine a day. The simultaneous intramuscular injection of œstradiol benzoate 100,000 I.B.U. daily caused a diminution of the number of flushes. The flushes in this patient were observed frequently; they lasted five to twenty minutes, and the increase of colour was noticed only in the face and neck, though the patient complained of a feeling of heat all over the body. Sweating was often pronounced, and sometimes capillary pulsation could be clearly seen in the face during the flush. Some tachycardia was usually present, but the blood-pressure taken on two occasions during a flush did not appear to be significantly changed from normal. Other symptoms that appeared later in this patient were deepening of the voice, growth of hair in the beard area, inhibition of menstruation, and increase of weight.

CASE 4.—A woman, aged 41, with menorrhagia of several years duration. She had never had flushes. She was given testosterone propionate, 950 mg. by intramuscular injection over a period of nineteen days. This produced severe and frequent flushes, which were later controlled by hexœstrol 3 mg. a day.

CASES OF MENORRHAGIA, TREATED WITH TESTOSTERONE PROPIONATE WITHOUT THE PRODUCTION OF FLUSHES

Age	Total dose of testosterone propionate (Mg.)	Period of administration (days)	Age	Total dose of testosterone propionate (Mg.)	Period of administration (days)
37	1000	19	42	1300	19
42	900	38	44	600	6
19	800	16	49	700	7
39	1000	10	45	1600	23
18	500	5			

When comparatively large doses of testosterone are given for menorrhagia, flushes are not necessarily produced; 9 patients with menorrhagia were given various doses of testosterone propionate for various periods (see table), and none had flushes.

Females with non-functioning gonads.—The injection of large doses of testosterone propionate into 2 women who were experiencing spontaneous flushes due to gonadal deficiency stopped the flushes.

CASE 5.—A woman, aged 36, had both ovaries removed four and a half years previously. Since then she had two or three flushes a day. The results of the injection of testosterone propionate are shown in fig. 3. After a control period testosterone propionate 300 mg. was injected on alternate days for three occasions; then two injections of 500 mg. each were given. The flushes disappeared and were still absent three weeks later.

CASE 6.—A girl, aged 21, had the syndrome described by Turner (1938). She was a dwarf and had webbing of the neck, without the changes in bony structure of Klippel-Feil's disease. She also had infantilism, cubitus valgus, and multiple moles. She had had hot flushes for four years. The results of the injection of testosterone propionate are shown in fig. 4. Three doses of 50 mg. each were sufficient to stop the flushes; and, when the dose was raised to 100 mg. daily, flushes still remained absent.

DISCUSSION

The administration of large doses of an androgenic substance causes flushes in both men and women with functioning gonads, and the flushes so produced may be stopped by the simultaneous administration of the œstrogens in the same manner as spontaneous flushes in women are stopped by the œstrogens. Yet, when

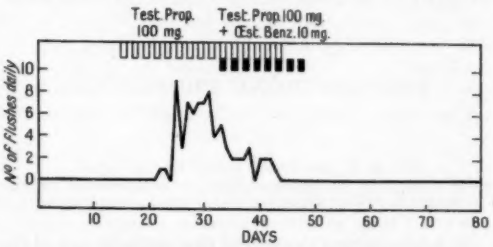

FIG. 2—Production of flushes by injection of testosterone propionate in a menstruating woman (case 3).

the flushes are spontaneous, as in a castrate woman, testosterone propionate does not make the flushes more numerous but stops them, even when massive doses are used.

At first sight these results appear contradictory. That testosterone propionate stops the flushes of castrate or postmenopausal women has been observed by other workers. Mocquot and Moricard (1936) were the first to claim amelioration of menopausal symptoms after administration of testosterone acetate; they gave only 5 mg. a week. Salmon (1937), Margiel and Zwilling (1936), and Shorr, Papanicoloau, and Stimmel (1938) reported similar results, and Kurzrok, Birnberg, and Livingston (1939) say that it is possible to control the symptoms of the menopause with 20–40 mg. of testosterone propionate weekly. The much larger doses given to the castrate woman had the same effect; and, although at one time it was considered possible that the production of flushes might depend on the amount of androgenic substance administered, the injection of 500 mg. had the same result as smaller doses in stopping spontaneous flushes.

On the other hand, the observation that large doses of testosterone propionate produce flushes in women with functioning ovaries has been noted by others. Castillo and Salaber (1939) reported on a woman, aged 33 years, with menorrhagia, who received 755 mg. of testosterone propionate and 150 mg. of testosterone dipropionate over forty-eight days. As a result of treatment she complained of flushes, dyspnœa, and palpitations. Foss (1938) described 2

cases: the first a woman, aged 45, with severe metrorrhagia, who received 400 mg. of testosterone propionate in thirty-six days, and the second a woman, aged 40, with menorrhagia, who was given 500 mg. in twenty-one days; both patients had numerous flushes after treatment. Our negative results in 9 cases of excessive uterine bleeding show that flushes are not always produced in such subjects, even when large doses of androgens are given. Many of these patients with menorrhagia are probably secreting excessive quantities of œstrogens, and there is an antagonistic action between the androgens and the œstrogens (Zuckerman 1936). On the other hand, the patient with normally functioning ovaries, case 3, had numerous flushes after large doses of testosterone.

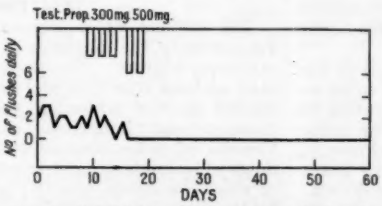

FIG. 3—Inhibition of spontaneous flushes by injection of testosterone propionate in a castrate woman (case 5).

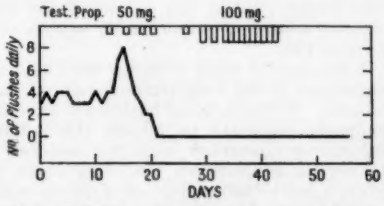

FIG. 4—Inhibition of spontaneous flushes by injection of testosterone propionate in a young woman with Turner's syndrome (case 6).

The production of flushes in normal men by testosterone propionate has not, so far as I know, been reported elsewhere, but in eunuchoid or castrate men who have spontaneous flushes the action of the androgens is the same as in castrate women: the flushes are stopped (Turner 1939, Vest and Howard 1938, Foss 1937, Hamilton 1937). In an attempt to explain these results the main difficulty arises in connexion with the action of testosterone propionate in an organism with normally functioning ovaries or testes. In the experimental animal the action of testosterone propionate on the ovaries is indifferent or stimulating when small doses are given for a short period (Wolf and Hamilton 1937a, McKeown and Zuckerman 1937, Salmon 1938), but definite degenerative changes are produced over longer periods (Mazer and Mazer 1939), and in the male animal the androgens depress the development of the testes (Korenchevsky and Hall 1939). Allanson (1937–38) showed that testosterone propionate prevented the appearance of castration cells in the anterior pituitary of castrated female rats, and Wolf and Hamilton (1937b) showed that the effect of testosterone propionate on the anterior pituitary differed somewhat from that of œstrogens. Whereas œstrogens caused an increase in weight of the gland and degranulation of the basophils and of some of the eosinophils, the only effect of testosterone propionate was degranulation of the basophils. That the œstrogens seem to impair the physiological activity of the anterior pituitary when given in sufficient quantities has been known for some time, and the evidence has been recently reviewed by Deansly (1939). The androgens seem to have a similar action at least so far as pituitary gonadotrophic activity is concerned (Hamilton and Wolf 1938, Hertz and Meyer 1937, Cutuly and Cutuly 1938). The precise action of large doses of the sex hormones on the anterior pituitary is still open to doubt, for histological evidence suggests that there is stimulation of cellular activity rather than the reverse (Severinghaus 1939); yet the great bulk of physiological experiments indicate that the eventual result is diminished activity of end-organs such as the gonads.

Less work has been done on the effect of the sex hormones on the anterior pituitary in man. The excessive quantities of gondotrophic hormone that are excreted in the urine of castrate or postmenopausal women can be abolished by large doses of the œstrogens (Frank and Salmon 1935, Jones and MacGregor 1936, Rowlands and Sharpey-Schafer 1939) and of the androgens (Salmon 1937). The gonadotrophic content of the anterior pituitary of postmenopausal women can be reduced to undetectable quantities by prolonged administration of large does of œstrogens (Rowlands and Sharpey-Schafer 1939). Using the urinary creatinine as an index of pituitary activity, Schrire and Sharpey-Schafer (1938b) showed that there was diminished activity in acromegaly after the injection of large doses of œstradiol benzoate (10 mg. daily) or of testosterone propionate (100 mg. daily). Similar results with œstrogens have been obtained in castrate and menopausal women (Sharpey-Schafer and Schrire 1939). On the other hand, the injection of œstrogens into normal men and women does not diminish urinary creatinine and in some persons may cause an increase, and a similar increase of urinary creatinine has been observed in normal rabbits after the administration of testicular extracts (Cheetham and Zwarenstein 1938). This evidence suggests that in man the effects of injection of the sex hormones depend on the degree of gonadal and pituitary activity already present. When the pituitary is overactive, as in acromegaly or in castrates, the result is inhibition of physiological function; but, when the pituitary and gonads are normal, there may be increased activity of the pituitary.

Albright's (1936) postulates for the causation of flushes may not be examined. A simple deficiency of the male hormone in the male and of the female hormone in the female is not a sufficient explanation, for the following reasons. As Albright has pointed out, flushes do not develop in cases where the sex-gland deficiency is consequent on a pituitary deficiency; the presence of an active anterior pituitary is apparently necessary for the phenomenon. Again, he says that the level of œstrogen excretion cannot be correlated with the onset of the flushes, and the observation that the injection of male hormone into a normal male may produce flushes is further evidence that the cause is more than a simple deficiency.

Albright's second postulate, that flushes are caused by an excessive secretion of pituitary gonadotrophic hormone, is less easily disposed of. Injection of quite large quantities of a pituitary gonadotrophic extract into normal men and women, though causing a sharp rise in urinary creatinine, did not produce flushes (Schrire and Sharpey-Schafer 1938a); yet, even so, the dosage may have been insufficient. Heller and Heller (1939) showed that, when small doses of œstrogens sufficient to stop flushes were injected into postmenopausal women, no change could be detected in the amount of gonadotrophic substance excreted in the urine. This suggests that flushes cannot be correlated with the level of pituitary gonadotrophic activity.

We are left with the third postulate, an unknown factor, probably connected in some way with the

pituitary, which can be counteracted by small doses of the œstrogens. The interesting observation of Callow, Callow, and Emmens (1939) that the injection of large doses of testosterone propionate into males leads to the appearance in the urine of œstrogenic substances even in castrates raises the possibility of the conversion of the androgens to œstrogens in the body or else of the stimulation of some other organ, such as the suprarenal, to secrete œstrogens. Though this might explain the action of the androgens in castrate women, it would hardly explain the flushes in normal men.

From lack of other evidence the relationship of the androgens to the flush phenomenon appears to be as follows. In castrates of both sexes administration of androgens appears to inhibit the action of some substances connected with the anterior pituitary. In normal subjects, on the other hand, large doses cause a grave disorganisation of the endocrine system, probably consisting of depression of the gonads and stimulation of the anterior pituitary. This experimental production of flushes by testosterone propionate may help to solve the problem of the causation of the vasomotor phenomena of gonadal deficiency.

SUMMARY

(1) The injection of large doses of testosterone propionate into both men and women with normally functioning gonads causes flushes. This action can be inhibited by the œstrogens.

(2) In castrate women, on the other hand, spontaneous flushes are stopped by testosterone propionate, even when massive doses are used. Similar results have been reported in castrate men.

(3) The apparent contradiction of the effect of testosterone propionate in producing flushes in normal subjects and inhibiting them in castrates is probably due to a difference in action, depending on whether the gonads are present or not.

(4) The relationship of these findings to the mechanism of the flushes of gonadal deficiency is discussed.

I wish to thank Dr. R. J. Kellar for allowing me to use his data on the cases of menorrhagia, and the medical officer of health for the county of London, for permission to publish case-records. To Messrs. Ciba Ltd. I am indebted for generous supplies of testosterone propionate.

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THE PROGNOSIS OF TETANUS*

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THESE observations are based on 43 consecutive cases of tetanus treated by approximately the same method and closely observed throughout the illness.

TREATMENT

The method of treatment has been as follows. Immediately the diagnosis is made, a large dose of antitoxin is given. The wound is not touched for at least an hour after this, and surgical treatment is then limited to the minimum necessary to secure free drainage and irrigation with hydrogen peroxide. Control of reflex spasms is maintained with large doses of bromide in mild cases and with paraldehyde, or more commonly Avertin, in basal anæsthetic doses by the rectum in severe cases. When either paraldehyde or avertin is used, cyanosis is controlled with warm nasal oxygen and atropine. All therapeutic and nursing activities likely to induce reflex spasms are reduced to a minimum and when unavoidable are performed when the patient is most deeply under the influence of sedatives. Care is taken that sufficient nourishment in fluid form is given throughout the illness.

Antitoxin has in most cases been limited to a single intravenous dose of 200,000 international units (I.U.), which has not been repeated. Latterly this dose has been reduced to 100,000 I.U. in a few mild cases, because it became clear that the larger dose was unnecessary. In 5 of the early cases it was given by the intrathecal and intramuscular routes as well as by the intravenous, and in these cases the injections were repeated during the early days of the illness. From subsequent experience it is clear that this variation in the method of giving antitoxin can have had no effect on the results in these particular cases, becuse 3 of them were mild cases which would have recovered with antitoxin given by any route, and 2 were so severe that recovery was impossible. Since these 5 cases were treated the use of intrathecal antitoxin has been entirely abandoned. In 2 other very severe cases a trial was made of larger doses of antitoxin, 360,000 and 520,000 I.U. being given during the eight hours following admission but without any apparent effect in postponing the fatal issue. The reasons for adopting this method of treatment have been fully discussed in previous papers, and the first 21 cases referred to in this series have been fully reported previously (Cole and Spooner 1935). In 3 of these cases an aqueous solution of curare was given for the relief of reflex spasms. In the light of subsequent experience there is no reason to suppose that this influenced the course of the disease, and its use has now been abandoned.

PROGNOSIS

In the assessment of prognosis the following factors have to be considered: age and general physique; sex; type and severity of wound; site of wound;

* Based on a communication given to the Association of Physicians at Birmingham in May, 1939.

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incubation period; rate of onset of symptoms; time at which antitoxin is given; and whether prophylactic antitoxin has been given.

Age and general physique.—Table I shows the best prognosis between the ages of five and twenty and

TABLE I—ANALYSIS OF RESULTS ACCORDING TO AGE-GROUPS

Age	Cases	Recovered	Died	Age	Cases	Recovered	Died
0—5	5	2	3	30—40	4	2	2
5—10	8	5	3	40—50	2	2	0
10—20	11	8	3	50—60	3	1	2
20—30	2	2	0	60 +	8	2	6

the worst over sixty. Of the 8 patients over sixty 6 died, and the only 2 who recovered had a very mild attack, with rigidity alone and no reflex spasms. The high incidence between five and twenty is probably attributable to the fact that between these ages the greatest activity is combined with the minimum of cleanliness.

In tetanus good physique is likely to count for a great deal. Cardiovascular degeneration certainly militates strongly against recovery. Chronic bronchitis and emphysema are also dangerous, because these, when combined with tonic rigidity of the muscles of the chest, make breathing difficult and predispose to pneumonia. These factors probably explain the high death-rate over the age of sixty, for all the patients in this age-group were bad subjects in these respects. In all patients intercurrent disease, particularly of the lungs or of the heart, is of serious significance, and the risk of pneumonia must always be borne in mind, particularly in patients requiring basal anæsthesia.

TABLE II—ANALYSIS OF RESULTS ACCORDING TO LESIONS

Type of wound	No. of patients	Recovered	Died
Severe:			
Compound fracture of radius and ulna with gross sepsis	1	—	1
Deep lacerated wound of left thigh	1	—	1
Deep dirty cut in left knee (stitched up)	1	—	1
Slight:			
Abrasions (usually dirty, with scabs)	9	6 (1 aged 64)	3 (2 aged 68 and 67)
Penetrating wounds from thorns, splinters, nails, or garden forks	12	9	3 (1 aged 61)
Whitlows	9	4	5 (2 aged 60 and 73)
Cut hand	2	—	2
Boil on neck	1	—	1
Otitis media	1	—	1
Epistaxis	1	—	1 (aged 65)
Umbilical sepsis	1	1 (aged 6 days)	—
Varicose ulcer	1	1 (aged 63)	—
Clean cut finger, washed at once and sealed with elastoplast	1	1	—

Sex.—Of 38 males 19 recovered and 19 died, whereas of 5 females all recovered. None of the cases in females were very severe, probably because the wounds were slight. The low incidence among females is probably explained by the fact that as children and by occupation they are less likely to get severe or infected wounds, and when they do they keep them cleaner.

Type and severity of wound.—It is recognised that the severity of the disease and the severity of the wound are roughly proportional, although there are many exceptions to this. In civil practice tetanus ought never to follow a severe wound, because it should always be prevented by prophylactic antitoxin. Slight septic wounds more often escape medical attention and therefore cause tetanus. In this series there were only 3 patients with severe wounds, and they came under treatment immediately and were not given antitoxin. All developed the most virulent tetanus and were dead within three days of the first symptom. All the other wounds were comparatively slight. The lesions are analysed in table II. In 2 patients who recovered there was no wound.

Even with the above slight wounds it is clear that there is a direct relationship between the severity of wound and of tetanus. Most patients with only abrasions recovered, unless they were old people.

TABLE III—ANALYSIS OF RESULTS ACCORDING TO SITE OF LESION

Site of lesion	Patients	Recovered	Died
Head or neck	6	3	3
Arm	15	6	9
Umbilicus	1	1	—
Leg	19	12	7

Broadly speaking, the amount of deep sepsis is the important factor determining severity. The cases following whitlows were severe, and it is perhaps not sufficiently realised that whitlows in farm workers or agricultural labourers are likely to cause tetanus; hence prophylactic antitoxin should always be given in such cases. Occasionally there are gross exceptions.

The most severe case in the whole series was in a boy, aged 7, who fell off his bicycle in the road, sustaining multiple superficial abrasions, to which no treatment was given. The incubation period was only forty-eight hours, and he was dead within four days of receiving the injury.

Another severe case with recovery followed a wound in which the tip of the index finger was sliced by broken glass on a garden frame. The wound was washed thoroughly at once and appeared perfectly clean. The skin was then replaced and sealed with elastoplast. Tetanus developed seven days later.

Site of wound.—Table III bears out what is generally recognised—that wounds of the lower extremities give the better prognosis.

Incubation period.—This is measured from the time the wound is received to the onset of the first symptom, which is most commonly stiffness of the jaw, but dysphagia, cranial-nerve palsies, pain and stiffness in a limb, or pain and stiffness in the neck or the back may develop first. It has long been thought that an indirect relationship exists between the length of the incubation period and the severity of the disease. Allbutt and Rolleston (1905) mentioned this, but, although many more recent writers support this view, others do not. Moore and Singleton (1939), in an analysis of 102 cases, find no evidence that a short incubation period is of grave prognosis but state that the mortality was greater in cases in which the incubation period exceeded five days than in those in which it was shorter. In the present series the incubation period could be measured in 38 cases, of which 19 ended in recovery and 19 in death. Of the patients who recovered only 2 had an incubation period of less than seven days (five days and six and three-quarters), and the average was eleven days.

Of those that died 7 had an incubation period of less than seven days, and the remaining 12 between seven and thirteen days, with an average of six and a half. In the remaining 5 patients the incubation period could not be measured, because there was no history of a wound. In all these the disease was mild and the incubation period probably very long. All recovered.

It appears that, whereas a short incubation period (under seven days) usually means a severe and fatal attack, a longer one (up to fourteen days) does not necessarily mean a mild one. This discrepancy is no doubt partly due to the fact that the true incubation period cannot be measured, because the time at which the wound is inflicted does not necessarily coincide with the time of infection or with the germination of the spores, which may be much later. The true incubation period is then much shorter than is apparent. As a rough working rule it may be said that under seven days the prognosis is bad and over fourteen good, but between these figures little reliance can be placed on its length (see fig. 1).

Period of onset.—When symptoms come on rapidly the prognosis is bad, and vice versa. The "period of onset" is the name which may conveniently be given to the time between the appearance of the first symptom of the disease and that of the first reflex spasms (the convulsive spasms superimposed on the tonic rigidity). This period gives a numerical indication of the rate of onset of the disease and can usually be accurately measured to within six hours. In severe cases, in which an error of a few hours would be most significant, it can be more accurately measured. In mild cases the error, although it tends to be greater, is less significant. In this series the period of onset could be measured in 29 cases under sixty. In 13 which were fatal it was forty-eight hours or less in 12 and seventy-two hours in 1. In 16 which recovered it was eighteen hours in 1 (a baby), forty-eight hours in 3, and over seventy-two hours in the remaining 12 (fig. 2). In patients with a period of onset of forty-eight hours or less who died the total duration of the illness was never more than four times the period of onset. The relationship between the period of onset and the duration of life in 19 fatal cases is shown in fig. 3.

In actual practice the period of onset is the most valuable guide to prognosis. If a patient is seen early, say twenty-four hours after the first symptom, and a large dose of antitoxin can be given at once, the issue depends on whether reflex spasms appear during the next twenty-four hours. If they do not, the prognosis is good; if they do, it is bad. If, on the other hand, a patient is first seen three days after the onset, antitoxin can be given at once; and, if there have been no reflex spasms, the prognosis is good. Expressed in another way, the appearance of reflex spasms within forty-eight hours of the onset indicates that a lethal dose of toxin has already been absorbed. Additional antitoxin cannot affect this but can only prevent the absorption of further toxin. When these clinical considerations indicate that a lethal dose of toxin has already been absorbed when the patient first comes under observation, large doses of antitoxin should still be given, because the above measurements are only approximate, there are exceptions, and it may still be possible to save life, although the chance becomes more slender as the period of onset becomes shorter.

Time of giving antitoxin.—The curative effect of antitoxin in any given case is difficult to assess, because it cannot be known how severe the illness would have been without it. Comparative statistics of different series are unreliable, because there are such great variations in severity; and comparisons of case-mortality in pre- and post-antitoxin days are again unreliable, because the use of prophylactic antitoxin may have profoundly altered the severity of the disease. Before the days of antitoxin tetanus must have developed often after severe wounds, and these cases must have been very severe and usually fatal. The case-mortality must have been higher because of this high percentage of severe cases, which does not obtain nowadays. The use of prophylactic antitoxin in cases of severe wounds nearly always prevents tetanus; therefore cases of tetanus tend to be milder because they usually follow slight wounds. A reduction in case-mortality since the introduction of antitoxin is just as likely to be due to the indirect effect of prophylactic antitoxin in preventing severe cases after severe wounds as to its curative effect. The sum of the evidence does suggest a reduction in case-mortality since antitoxin has been used (Fildes 1929, Permin 1914), but it is difficult to show clinically that this is due to the direct therapeutic effect rather than to the indirect prophylactic effect.

TABLE IV—RELATION OF TIME OF ADMINISTRATION OF ANTITOXIN TO TIME OF ONSET OF TRISMUS AND ONSET OF REFLEX SPASMS

Administration of antitoxin			
Relation to trismus		Relation to reflex spasms	
Time	Cases	Time	Cases
Within 24 hours .	11	6 hours or more before	13
24–36 hours after .	5	At onset of spasms	11
48 „ „ .	7	6 hours or more after	11
3 days „ .	8		
More than 3 days after	7		

On theoretical grounds, however, there can be little doubt that antitoxin does in many cases, if it is given soon enough, prevent the absorption of a lethal dose of toxin so that recovery takes place. These cases are those in which absorption of toxin has been sufficiently slow to produce symptoms before a lethal dose has been absorbed by the nervous system. Abel and Chalian (1938) emphasise that, because in tetanus in man it is not known at what point this takes place, it is always important to give large doses of antitoxin as early as possible. In this series the point at

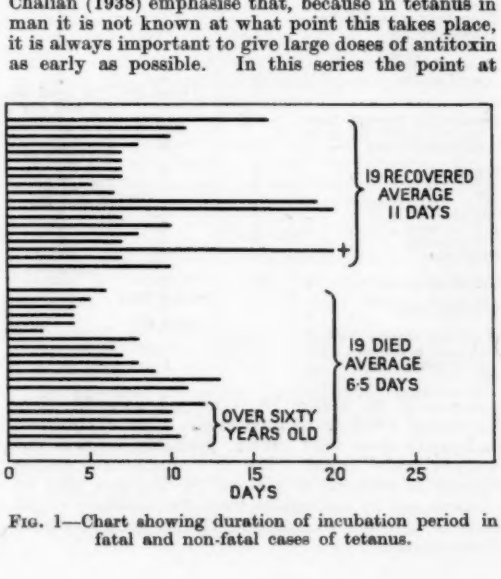

FIG. 1—Chart showing duration of incubation period in fatal and non-fatal cases of tetanus.

which antitoxin has been given in relation to the onset of trismus and the onset of reflex spasms is given in table IV. The numerical relationship between the time of giving antitoxin and the case-mortality is of no significance, because severe cases naturally tend to be seen by a doctor early and to be treated with less delay. The figures do, however, show that much valuable time is lost before the administration of antitoxin. Of the 19 patients who died only 7 received it within twenty-four hours of developing trismus, 4 more within thirty-six hours, 4 more within forty-eight hours, and 4 only after forty-eight hours. It is likely that some of these patients might have been saved if antitoxin had been given at once. That this is not done is due partly to the fact that patients do not consult a doctor at once. Often, however, when they do, there is delay until the diagnosis is confirmed by the march of symptoms. This is because tetanus is comparatively rare and not at once recognised. Trismus, usually with stiffness in the back of the neck, following a septic wound should present no difficulty, and in cases of doubt even a smaller dose of antitoxin given intramuscularly at once, while arrangements are being made for removal to hospital, might save life. Failure in early diagnosis

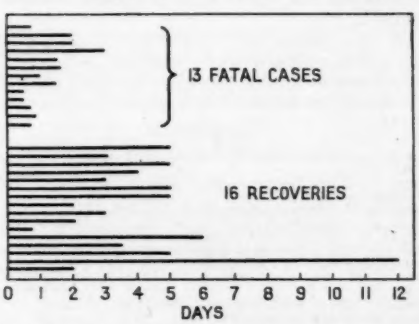

FIG. 2—Chart showing duration of period of onset in fatal and and non-fatal cases of tetanus in patients less than sixty years old.

is perhaps partly due to the fact that the disease is very rare in large cities where most of the medical schools are situated, and so it is relegated to the same section of the student's mind as such diseases as glanders and plague. The importance of giving antitoxin early in tetanus should be as strongly emphasised as it is in diphtheria, and early diagnosis is as easy to make.

Effect of prophylactic antitoxin.—A prophylactic injection of antitoxin, if it does not prevent tetanus, usually modifies it profoundly. The incubation period is prolonged, often to many weeks, the symptoms come on slowly, and local tetanus is common. In many cases tonic rigidity only is present throughout the illness and reflex spasms do not appear. The prognosis is much better than when no prophylactic injection has been given. Thus, in a series described by Dean (1917), of 25 patients who developed tetanus after having been wounded in the battle of the Somme and had probably all received prophylactic antitoxin 14 had local tetanus, the incubation period being very prolonged, and 21 recovered. Cases which developed in the Great War after prophylactic antitoxin have shown that a single injection is often not sufficient to protect, and Dean emphasises the importance of repeating the injection in all cases where the wound is severe, or when further operation is needed. Sometimes very severe tetanus follows in spite of

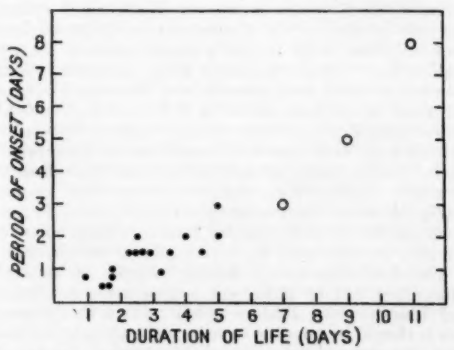

FIG. 3—Chart showing relationship of period of onset to duration of life in 19 fatal cases of tetanus. The open circle denotes presence of either old age or pneumonia.

prophylactic antitoxin, and this fact is well illustrated by the following case:—

A labourer, aged 38, was admitted to hospital having crushed the first three toes of his left foot in a cement mixer. The skin over the great toe was broken, with a hæmatoma beneath the nail, and there were abrasions of the second and third toes. Antitoxin 2000 I.U. was given immediately on admission, and the wound was treated with iodine and dry dressings. After admission a cellulitis of the big toe and dorsum of the foot developed, which was treated by hot baths and fomentations. The infection of the toe was severe, with a good deal of tissue necrosis, but it settled down satisfactorily in ten days.

Thirteen days after the injury stiffness of the neck, abdominal pain, and trismus developed, and 200,000 I.U. of antitoxin was given intravenously within three hours of the first symptom. In spite of this the disease advanced extremely rapidly. The first reflex convulsion took place twenty-one hours after the first symptom, and subsequently these were controlled with avertin. The patient died eighty-one hours after the first symptom.

This case illustrates the fact that a single small dose of prophylactic antitoxin is insufficient to protect from fatal tetanus. Antitoxin 3000 I.U. should have been given in the first instance, and in view of the severe sepsis and tissue necrosis this should have been repeated. In all cases when septic wounds cannot be drained or foreign bodies are present, antitoxin should be repeated, 3000–5000 units being given on alternate days for three injections and after that weekly for three weeks, or until the infection is cured. A further injection should always be given a few hours before operating on an old wound. In this patient, in spite of the long incubation period (thirteen days), the short period of onset (twenty-one hours) showed that more than a lethal dose of toxin had probably been absorbed and fixed when the first symptoms appeared, and there was little chance of saving his life. The fact that a large intravenous dose of antitoxin was given within three hours of the appearance of the first symptom shows that antitoxin has little chance of success if more than a certain amount of toxin has been absorbed before it is given.

Comparison of civilian and war wounds.—It must be emphasised that the results in this paper are based on civilian casualties and refer to cases in which, with a few exceptions, the wounds are slight. Severe wounds in civil practice should never lead to tetanus, because it should be prevented by the administration of prophylactic antitoxin. In the confusion of war, however, there is a greater possibility that after severe

wounds this may not be done. With slight wounds the rate of absorption of toxin is likely to be more constant than with severe wounds such as are met with in war. With the latter, large amounts of toxin may be produced very quickly, and there may be great variation in the rate at which it is produced and absorbed over a given period of time, with corresponding variation in the march of symptoms. The results quoted in this paper are less likely to be true of severe wounds. Cases which follow severe war wounds which have not been treated with prophylactic antitoxin are likely to be rapidly fatal. These, however, can now be prevented by active immunisation, and it is desirable that every soldier should be actively immunised before going on active service (Zoeller and Ramon 1926, Ramon 1936). With this precaution it should be possible to reduce the already reduced incidence of tetanus to a negligible figure.

TREATMENT

Tetanus is so variable that the comparative case-mortality in different series is an unreliable index of the efficacy of a particular line of treatment. When a new treatment is tried, an attempt should be made to compare the results in cases of approximately the same degree of severity. In making this comparison the period of onset is perhaps the best index, although the other factors mentioned must also be considered.

Consideration of prognosis on the lines suggested in this paper may also prevent waste of antitoxin. It is not unusual to read accounts of patients treated with heroic doses of antitoxin, which are continued long after all reflex convulsions have ceased. Cables (1938) described one in which, although spasms had almost stopped on the seventh day of the disease, antitoxin treatment was continued until the forty-second day, 3,460,000 I.U. being given in all. Lovelock-Jones (1933) described another in which antitoxin was continued until the end of the fourth week, 1,800,000 I.U. being given at a cost of nearly £90. In this series repeated injections of antitoxin were only given to the first 7 patients during the first few days; a single initial injection was given to the remainder. There has been no indication that once the disease had begun to subside it tended to become worse again. The residual tonic rigidity and trismus is a benign condition which slowly passes off and needs no further treatment. The only type of case in which it may be well to repeat antitoxin is that in which there is a deep heavily infected wound which cannot be drained. It would then be wise to repeat an injection of 50,000 I.U. once a week or once a fortnight to prevent further absorption of toxin from the wound. A further injection should also be given before any surgical operation on the wound is performed.

SUMMARY

(1) The prognosis of tetanus is considered from a detailed clinical study of 43 consecutive cases in civilian practice treated by the same method.

(2) Prognosis depends on the age and general physique, sex, type, severity and site of the wound, incubation period, rate of onset of symptoms, time at which antitoxin is given, and whether prophylactic antitoxin has been given.

(3) Patients over sixty have small chance of recovery unless the disease is very mild.

(4) Cardiovascular degeneration, chronic bronchitis and emphysema, when combined with tonic rigidity of the chest, predispose to pneumonia, which is usually fatal.

(5) The prognosis is better in women.

(6) There is a direct relationship between the severity of the wound and the severity of the disease. Whitlows in agricultural workers are a common cause. Wounds of the upper limb show a higher case-mortality than those of the lower.

(7) The incubation period is only a rough guide to prognosis, because it cannot be measured accurately. If it is less than seven days, the prognosis is usually bad; if it is more than fourteen, the prognosis is usually good.

(8) The period of onset of reflex spasms is the most useful guide to prognosis. If these come on within forty-eight hours after the first symptoms of the disease appear, the prognosis is bad; if later, the prognosis is good. A lethal dose of toxin tends to produce reflex convulsions within forty-eight hours of the first symptom.

(9) There is usually unnecessary delay in making the diagnosis and therefore in giving antitoxin. The administration of antitoxin at the earliest possible moment is as important in tetanus as it is in diphtheria.

(10) Prophylactic antitoxin should be repeated in all cases of suspicious wounds.

(11) All soldiers before going on active service should be actively immunised against tetanus.

(12) In comparing the results of different methods of treatment the above criteria should be used as a standard.

(13) It is unnecessary to continue to give antitoxin when reflex convulsions have ceased and only tonic rigidity remains. An exception to this rule is when there is a septic wound which cannot be drained.

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CONGENITAL CYSTS OF THE PAROTID GLAND

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CYSTS of the parotid gland are rare. Stone and chronic inflammation are so uncommon in the gland that cystic dilatations from these causes are seldom encountered. A mixed parotid tumour, the commonest of the chronic lesions affecting the gland, may undergo sufficient degeneration to simulate a true cyst, as also may the much rarer adenoma. It is to developmental anomalies that the few cases of true parotid cysts which have been recorded owe their origin. This paper is a review of our knowledge of the condition, together with a report of what is believed to be the only recorded case of successive bilateral parotid cysts.

CASE-RECORD

A male, aged 60, was admitted to hospital on Jan. 28, 1938. For six months he had had a swelling in the left side of the face. It did not vary in size.

On examination the patient was in good general condition. There was a smooth cystic swelling about the size of a small plum overlying the left parotid. It was not attached to the skin and had some mobility on the deeper structures. No other abnormalities

were found on complete examination. The swelling was thought to be a soft mixed parotid tumour. Excision followed by radium implantation was advised.

Operation.—On Feb. 9, 1938, under general anæsthesia, a transverse incision was made over the tumour, which was found to be a unilocular cyst lying in the superficial part of the parotid gland. During dissection it was inadvertently punctured, and brown turbid fluid escaped. The cyst wall was completely excised and the wound closed with interrupted sutures. The patient had an entirely uneventful convalescence and was discharged on the 18th. Owing to an error the cyst and its fluid contents were not kept for examination.

The patient was readmitted to hospital in December, 1938. In August he had noticed a swelling about the size of a gooseberry near the angle of the right mandible. It had slowly increased in size but had caused no inconvenience apart from occasional shooting pains over the right eye.

On examination the scar of the previous operation on the left parotid was scarcely visible, and there was no evidence of any recurrence of the cyst. A cystic swelling about the size of a victoria plum was present in the lower part of the right parotid. It was extending both in front of and behind the lobe of the right ear, which it was pushing forwards in characteristic manner. No other physical signs were found on complete examination.

Operation.—On Dec. 9, under local anæsthesia, a transverse incision was made extending forwards from the lobe of the ear. The parotid gland was incised in the line of the incision and a blue-domed cyst exposed. This was carefully dissected out. During the manœuvre it was punctured, and opaque brownish-white fluid escaped. The cyst extended very deeply into the parotid gland. All parts were carefully removed, and the wound was closed with interrupted sutures. The patient was discharged on the 16th.

He was seen again in May, 1939, and there was no evidence of recurrence of either cyst. The fluid from the right parotid cyst had a protein content of approximately 5 per cent. It contained no ptyalin, but cholesterol crystals were seen on microscopical examination, which also showed that the cyst wall was lined by a stratified epithelium (see figure). In the fibrous wall there were numerous lymphoid aggregations.

DISCUSSION

It is evident from a study of published reports that a group of ætiologically related lesions, commonly believed to be branchogenic, may affect the parotid gland. These may take several forms and surprisingly appear to have no constant histological structure. They may be either pure cysts or cystic tumours. The basic structure of each is lymphoid tissue lined by epithelium, which, although usually stratified and squamous, may be columnar and is sometimes ciliated. This last fact suggests an endodermal origin for this particular type of cyst.

Hildebrant (1895) appears to have been the first to report a case of parotid cyst. He included it in a report of 20 branchial cysts of the neck and believed it to have an identical ætiology. The cyst was lined by stratified epithelium, the basal cells of which were columnar. Numerous lymphoid follicles were present in the wall and protruded into the cyst, giving it an irregular internal surface. Since then only 26 cases have been reported. These have all been in or closely related to the parotid. In 12 cases the cyst has been unilocular and has contained much lymphoid tissue in the wall. In the other 14 cases the same tissues have been arranged as solid lymphoid tumours containing numerous small cysts lined by columnar or by stratified epithelium. A curious feature of several cases has been that the type of epithelium has varied in different parts of the tumour.

Origin.—The most generally accepted theory is that these cysts arise from the first branchial cleft. Hildebrant (1895), Glass (1912), Mazza and Cassinelli (1922), Cunningham (1929), and Hanford (1931) subscribed to this theory. Various other theories have been proposed from time to time. Thus Lecène (1908) suggested that the structure of these cysts was very similar to that of the embryonic tonsil and therefore probably arose from the endoderm in the region of the second pouch. Albrecht and Artz (1910) believed that they resulted from changes in the parotid lymph-glands in which epithelium from the pharynx had been buried during development. Warthin (1929) thought that the histological picture in his cases simulated that of polypi of the eustachian tube which he had examined. He therefore suggested that the cystic tumours of the parotid which he reported were due to the inclusion of pharyngeal epithelium in the parotid gland. He differed from Albrecht and Artz in that he believed that the lymphoid tissue was also derived from the pharynx and was part of the tumour and not the remains of the parotid lymph-gland. Kraissl and Stout (1933) adduced evidence to show that congenital parotid cysts and cystic tumours of the type under discussion arise from a vestigial tube which develops from the buccal ectoderm and comes to lie near the parotid. In animals this structure forms the orbital salivary glands. In man it usually disappears but may persist and be responsible for the formation of a cyst or a cystic tumour in the parotid gland. The exact site of origin of these cysts is of academic interest only. It is certain they are of congenital origin.

Microphotograph of parotid cyst, showing stratified epithelial lining and many lymphocytes in the wall. (×100.)

Pathology.—The disease may take one of two forms. In some cases a unilocular cyst is found in the parotid gland. Microscopically this is seen to have a fibrous wall lined by stratified squamous epithelium. Sometimes the epithelium is columnar and may be ciliated. A characteristic feature of these cysts, as it is also of the common branchial cysts in the neck, is the numerous aggregations of lymphoid tissue in the wall. In the other cases a more solid tumour containing numerous small cysts is found. Microscopically this is seen to consist mainly of lymphoid tissue, and the cysts are lined by stratified squamous or columnar epithelium. The cyst fluid in either type is brown and simulates that found in branchial cysts. Cholesterol crystals can usually be demonstrated. Although no case has been reported, there is no doubt that these cysts and cystic tumours may become malignant.

Symptoms and diagnosis.—The patient presents himself with a painless fluctuating swelling in the parotid region. There is no facial palsy. There may be inflammation in the cyst, causing sinuses, as reported by Cunningham (1929). The condition is so rare that a correct diagnosis is not generally made, the cyst being usually regarded as a soft mixed parotid tumour. In the unilocular cyst the diagnosis can easily be made by aspiration, when the characteristic fluid will be obtained.

Treatment.—The correct treatment is excision, which, if complete, will prevent recurrence.

My thanks are due to Mr. H. H. Rayner, under whose care the patient was admitted to hospital, for his kind permission to make this report.

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TREATMENT OF ECZEMA WITH VITAMIN-B COMPLEX

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To the general practitioner without much training and experience in dermatology the diagnosis of eczema is not always easy. Toxic or artificial dermatitis, skin infections caused by fungi and bacteria, and even prurigo, ichthyosis, and scabies may at times be difficult to distinguish from a typical eczema. Nor is the ætiology of eczema simple; it is rather more complicated and manifold than that of any other skin disease. The reason for this may be that those things which we at present consider to be causes are really exciting causes only, while the essential cause of eczema is still unknown. It is no wonder, therefore, that the treatment is difficult, and that the different treatments at present in use are numerous.

Our knowledge of allergy, hormones, and vitamins has so far not solved the questions of ætiology, diagnosis and treatment of eczema. We know that certain skin diseases which occasionally or regularly constitute symptoms of the vitamin deficiencies—e.g., symmetrical dermatitis of pellagra—disappear when the deficiency is cured. We also know that the vitamin-B complex includes several dermatitis and skin factors, but this knowledge has not previously been systematically utilised in the treatment of eczema.

During the last three years one of us (K. P. K.) has treated eczema by saturating the patient's system with vitamin-B complex. In typical eczema (in which there can be no doubt of the diagnosis) this treatment has generally been so striking that it suggests that eczema may be a sign of a deficiency of vitamin-B complex. Against other skin diseases this therapy has no such specific effect. In a series of more than 100 unselected cases of eczema many different preparations of vitamin-B complex were tried, some by mouth and some by injection. They seemed to be all equally effective against eczema. The amount of vitamin-B complex given, but neither the variety nor the origin, appears to be of importance.

In a series of 20 non-selected cases of eczema (13 chronic and 7 acute or subacute) the same kind of vitamin-B complex (Bevital Leo, a Danish preparation) was used for every case.

This is marketed in tablets and as a paste; each cubic centimetre of paste contains the equivalent of 20 g. of yeast, and each tablet 5 g. of yeast. Hence 5 c.cm. of the paste or 20 tablets contain enough vitamin-B complex to supply the daily requirements of an adult human being. Generally 12 tablets a day have been ordered or in more severe cases two or three teaspoonfuls of the paste stirred up in boiling water. This, added to the amount of vitamin-B complex contained in the patient's ordinary diet, has always been sufficient to cure the eczema and, apparently, to establish a surplus, sufficient to protect him against new attacks of eczema for some time to come. There is no danger of overdosing, even with far greater amounts.

Of the 13 chronic cases 3, besides eczema in other sites, showed volar or plantar hyperkeratosis, which disappeared under treatment. In 3 cases there were very pronounced and troublesome eczematous cracks of several years' duration at the corners of the mouth. This is a not uncommon sign of a deficiency of vitamin-B complex and in some cases may be found without any other symptom of eczema. Some of the acute and subacute cases had a definite allergic origin, which apparently did not prevent the treatment from taking effect.

The number of patients treated seems to prove that it is possible in practically all cases to cure eczema by the administration of vitamin-B complex. In a few days the itching disappears and healing begins, progressing in the acute cases so evenly and rapidly that the improvement is visible almost from day to day. Generally in a week or ten days the acute eczema is healed. In about one or two weeks the chronic cases are definitely better, but the time required for complete healing varies from case to case. In our chronic cases the eczema had been present (on an average) for twenty years or had been recurring (on an average) during fifteen years.

One patient was an army officer, aged 74, who had suffered from eczema since early childhood. He had always been treated by the foremost specialists. Since 1930 he has four times been a patient in Rigshopitalet, each time for one or two months. Shortly after his leaving the hospital the eczema would return, sometimes only three or four days after. So far as he remembers, he has only once (from August, 1914, to January, 1916) been free from eczema. In January, 1938, he began to take Bevital Leo, 1 teaspoonful thrice daily. Improvement set in immediately, and he has now been well for more than a year and a half.

When a patient has been cured, he may, by continuing the treatment with a far smaller dosage than that necessary for cure, prevent relapses. Herein lies a very definite advantage of this treatment. It may not be very difficult for an experienced dermatologist to cure a patient with eczema; but for the specialist and general practitioner alike it is only in exceptional

cases possible to advise the patient intelligently about how to avoid relapses and further attacks. By the method here advocated this should now be possible.

The vitamin-B complex includes so many single factors with different properties that the question naturally arises as to which of these is responsible for the cure of eczema. Apparently it may be that factor, lack of which causes eczema. The vitamin-B complex consists of vitamin B_1 and the vitamin-B_2 complex (formerly called G). Our experience indicates that vitamin B_1 (aneurin or thiamine chloride) is not concerned in the cure of eczema, nor the lack of it with the cause of eczema. We have seen a case of typical eczema begin and continue for months in a patient undergoing intensive treatment for polyneuritis with vitamin B_1 by injection and by mouth. On the other hand, the vitamin-B_2 complex contains more than one factor necessary for metabolism and having to do with the maintenance of the skin in normal condition. Different workers have, for instance, already described P-P, the pellagra-preventing factor; vitamin B_6, the rat-dermatitis factor; the so-called filtrate factor, responsible for chicken dermatitis; and the skin factor H. Nevertheless, although the factor concerned in the cause and cure of eczema in all probability resides in the vitamin-B_2 complex, we have produced excellent results by the administration of the whole vitamin-B complex.

THE CEREBROSPINAL FLUID IN ALKALOSIS

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ALKALOSIS is now well recognised as a clinical entity. In 1922 MacAdam and Gordon recorded a case of periodic alkalosis with vomiting, and in 1923 Hardt and Rivers gave a full account of the clinical and chemical findings in the condition complicating both pyloric obstruction and the alkali treatment of peptic ulcer. Descriptions have also been published by Hurst et al. (1925), Cooke (1932), and Ryle (1936) under the heading of gastric uræmia.

CLINICAL FEATURES

Alkalosis develops in cases of duodenal and gastric ulcer, and pyloric and intestinal obstruction, and after vigorous alkaline therapy; repeated vomiting and gastric hæmorrhage sometimes play a part in its production. The early symptoms include anorexia (with particular distaste for milk), apathy, irritability and nervousness, headache, dizziness, and pruritus. There may be nausea, vomiting, and abdominal pain, together with generalised pains and tingling in the limbs. In severe cases mental disturbances, drowsiness, hiccup, muscular twitching, epileptiform convulsions, stupor, and coma follow, and death may supervene.

The blood shows an alkalosis as indicated by increased power to combine with carbon dioxide, increased plasma bicarbonate, and a raised pH. Blood-chlorides are reduced, and blood-urea is increased. The volume of urine passed may be increased (Cooke 1932) or, if there is abnormal loss of fluid, diminished (Brown et al. 1923). The urinary reaction may be acid or alkaline (McCance 1936), and casts may be present. There is little alteration in the daily excretion of urea, but chlorides and ammonia are almost absent from the urine (Cooke 1932). Of these findings we wish to refer especially to the raised blood-urea and low chlorides. Such a change in blood chemistry has been fully discussed by McCance (1936), who points out that it may also take place in other conditions, such as Addison's disease and diabetic coma.

ÆTIOLOGY

Although the mechanism of alkalosis has not been fully elucidated, the following factors are concerned in the clinical syndrome :—

(1) *Alkalosis* appears to be the basic factor, but its relation to the other changes in the blood is not clear.

(2) *Hypochlorœmia.*—Emphasis has been laid on the low blood-chlorides by Blum (1928), Wildman (1929), and others, so much so that the condition has been described as *urémie par manque de sel.* This idea is not generally accepted, and McCance and Widdowson (1937) definitely oppose it.

(3) *Renal insufficiency.*—In the developed syndrome renal insufficiency has often been demonstrated in the form of decreased clearances of sulphate and urea (Berger and Binger 1935), and impaired excretion of phenolsulphonephthalein (Brown et al. 1923). The inulin-clearance test has revealed a deficiency suggesting that the major defect is a fall in glomerular filtration (McCance and Widdowson 1937). It has also been shown that on recovery it is possible for renal function to return to normal. Previously existing damage of the kidney has been cited as a possible cause (Ryle 1936); in most cases there is no evidence that it is present, but it may be a predisposing factor.

CASE-RECORDS

CASE 1.—A man, aged 52, was admitted to hospital on Nov. 8, 1936, having had repeated attacks of abdominal pain and vomiting over several years. Continuous vomiting had been present for five days, on the last of which it had been accompanied by hiccup. He was rapidly becoming unconscious on the sixth day when he was admitted. He was very wasted, unconscious, and extremely restless; slight cyanosis was present with normal respiration. The tongue was dry and brown, but the breath had no particular odour. The blood-pressure was 110/80 mm. Hg.

There was no abnormality in the heart, lungs, nervous system, or fundus oculi. The abdomen was not distended or tender. The temperature was 97° F., the pulse-rate 80, and the respiration-rate 24. Shortly after admission he had a generalised convulsion, with widespread rigidity followed by clonic spasms of the face, trunk, and limbs; the whole fit lasted 30 sec., and two similar attacks occurred later in the day.

The urine, which had a specific gravity of 1·010, was acid and showed slight albuminuria. The condition was thought to be uræmia, and the blood-urea was 324 mg. per 100 c.cm. The cerebrospinal fluid (C.S.F.) was examined and found to be normal, except for a low chloride value of 540 mg. per 100 c.cm. In view of this the possibility of alkalosis, producing hypochlorœmia and consequently a low C.S.F. chloride, was considered, and the patient was treated with rectal and intravenous injections of glucose saline. He showed some response, the blood-urea being 300 mg. per 100 c.cm. the next day, but he became worse and died three days after admission. Necropsy revealed a chronic duodenal ulcer with severe pyloric stenosis. The kidneys showed no naked eye abnormality.

In this case the final diagnosis was alkalosis due to pyloric stenosis. The extremely low C.S.F.-chloride value was an interesting feature, which in this case first suggested the diagnosis.

CASE 2.—A man, aged 48, who for twenty years had had many attacks of abdominal pain. During

the last year there had been mild anorexia, and the attacks had become more severe and frequent and had been accompanied by vomiting. He was admitted to hospital on May 15, 1937. Fractional test-meal showed moderate hyperchlorhydria, with some delay in emptying, and radiography revealed a duodenal ulcer without stenosis. He was treated for one month in bed with a strict diet and alkaline powders. All symptoms disappeared. Two months later he had insomnia followed by severe headache and generalised pains with muscular twitching in the legs. He recovered in a week. A few weeks later attacks of abdominal pain recurred and were accompanied by occasional vomiting.

On Sept. 25, 1937, he had a more severe attack, with severe headache, irritability, drowsiness, restlessness, and confusion, and on Oct. 6 he was readmitted to hospital. He was then restless and confused. His face had a dusky sallow appearance, which his wife stated had recently developed. He had some hesitancy in speech and said that he knew what he wanted to say but could not say it. There was gross generalised twitching of muscles with spontaneous movements of large amplitude in the limbs. The nervous system was normal. The tongue was dry and furred, but there was no uræmic odour in the breath. The left ear had a large chronic perforation, and there was a history of otorrhœa since childhood, but the discharge had recently ceased. Blood-pressure 140/90 mm. Hg. Heart and lungs normal. The abdomen was a little distended. Temperature 97·2° F., pulse-rate 102, respiration-rate 20. His confusion rapidly increased, and he became very restless, continually getting out of bed.

The urine had a specific gravity of 1·005; neutral reaction; a trace of albumin; and occasional red blood-cells but no casts in the centrifuged deposit. Blood: urea 190 mg. per 100 c.cm.; leucocytes 9900 per c.mm.; Wassermann reaction negative. C.S.F.: pressure 150 mm.; cells absent; globulin slightly increased; chlorides 560 mg. per 100 c.cm.; urea 180 mg. per 100 c.cm.; Lange reaction normal.

Paraldehyde 6 drachms in olive oil was given per rectum, after which he became quiet with, however, Cheyne-Stokes respiration. A 5 per cent. solution of glucose saline was given by continuous intravenous drip for four days, a total of 26 pints being given. During the next two days his condition was unaltered, but on the fourth day the blood-urea had fallen to 128 mg. per 100 c.cm. and the C.S.F.-chlorides had risen to 750 mg. per 100 c.cm. He was more responsive to his surroundings, and, since he was taking fluids very well by mouth, the intravenous saline was discontinued. Thereafter his improvement continued, and on Oct. 30 the C.S.F.-urea was 70·8 mg. per 100 c.cm., the chlorides being almost constant at 740 mg. per 100 c.cm. He was discharged on Dec. 8, when he felt very well and had no pain and his appetite was better than it had been for years, but the blood-urea was 72 mg. per 100 c.cm. and the standard urea clearance only 21 per cent. of normal.

Two months later, the patient having been on light diet without alkalis, the blood-urea was 44 mg. per 100 c.cm. and the standard urea clearance 53 per cent. of normal, suggesting that the condition had improved considerably. On April 18 he was readmitted to hospital complaining of severe colicky abdominal pain. The blood-urea had increased to 105 mg. per 100 c.cm. and the standard urea clearance decreased to 36 per cent. of normal. The C.S.F.-chlorides were practically unaltered at 730 mg. per 100 c.cm. Radiography showed pyloric stenosis.

On May 11 posterior gastro-enterostomy under general anæsthesia was performed by Mr. Digby Chamberlain. There was a large chronic duodenal ulcer with so much surrounding induration and œdema that the lumen was almost obliterated. Convalescence was normal. The blood-urea gradually fell, and on June 2 it was 52 mg. per 100 c.cm. and the standard urea clearance 51 per cent. of normal. Three months later he had gained a stone in weight and was in excellent health and free from symptoms. Blood-urea 74 mg. per 100 c.cm. Standard urea clearance 47 per cent. of normal.

COMMENT

The two cases described showed several features which deserve consideration. Both had long histories, and it is in such cases that alkalosis is most likely to develop. In support of this Cooke (1932) records eight cases developing the condition in which the average duration of symptoms was eight years.

Hiccup and epileptiform convulsions were sufficiently prominent in case 1 to suggest true uræmia. Rachmilewitz (1934) has pointed out that "lack of accompanying signs of kidney involvement such as changes in the fundus, increased blood-pressure, and anæmia distinguish these cases from the ordinary uræmia." To these we add the absence of "uræmic" odour in the breath and of the typical hissing respiration. Although fishy odour in the breath has been described in alkalosis (Ryle 1936), we could not detect any such odour in our cases in spite of their severity.

Although the whole pathology of alkalosis is by no means fully understood, there is no doubt that, in the developed condition, renal insufficiency is present and must be considered as an important factor. Our second case shows that, although in the acute stage there may be severe renal impairment, considerable recovery is possible. The final urea-clearance test four months after operation still showed evidence of renal impairment. Whether the defect is due to previous renal disease or is the result of alkalosis it is impossible to say definitely, but we could discover no history or evidence of previous renal damage, and it seems likely that severe alkalosis may cause renal impairment, which may or may not be permanent.

We were much interested in the C.S.F. findings it the two cases and thought that in certain circumstances the estimation of the chlorides and urea might prove useful in the differential diagnosis, particularly as it is known that the most potent factor in causing a fall in C.S.F.-chloride is a fall in blood-chloride (Harrison 1930, Linden and Carmichael 1928). We therefore carried out a series of investigations in different diseases in an attempt to assess the significance of the findings. The urea was estimated by the hypobromite method as described by Fowweather (1925) and the chlorides by simple titration of silver nitrate (0·5814 per cent.) into 2 c.cm. of C.S.F., potassium chromate being used as the indicator. The results were as follows, the chlorides being expressed as mg. of sodium chloride per 100 c.cm. and urea as mg. of urea per 100 c.cm.

(1) In twenty normal subjects the average chloride value was 718 and the average urea 27·5.

(2) In a group of nine cases of peptic ulcer without symptoms of alkalosis the averages were 729 and 36·8.

(3) Out of thirteen cases of intestinal obstruction eleven showed chloride values below 700, and in eight the urea values were considerably raised, the averages being 666·6 and 94·5.

(4) In five cases of severe vomiting due to diabetic coma, hyperemesis gravidarum, cerebral tumour, acute dilatation of the stomach, and of obscure origin the chlorides were reduced and the urea raised in every case, the averages being 656 and 69·7.

(5) Fourteen cases of nephritis were examined. In nine azotæmia predominated, and the average results were 780 and 283; in five cases with gross œdema the averages were 766 and 63. In no case were the chlorides reduced, the lowest being 730.

(6) The average values in fifteen cases of tuberculous meningitis were 614 and 49·6.

(7) In two cases of Addison's disease the chlorides were 640 and 660 and the urea values 45·2 and 230·2.

In the cases of alkalosis, intestinal obstruction, severe vomiting, and Addison's disease which were examined there was considerable reduction of chlorides and elevation of urea in the C.S.F. In contrast to this the cases of nephritis showed elevation of both urea and chlorides, and the cases of tuberculous meningitis a reduction of chlorides without a gross elevation of the urea. In the first group of conditions it is known that there is a raised urea and decreased chloride content in the blood, but we feel that it should be more widely appreciated that these changes are reflected in the C.S.F. It has been suggested (Nicol and Lyall 1939) that the changes in the C.S.F. in alkalosis may be helpful in the differential diagnosis in some instances. We wish to endorse this view, and we consider its value is most outstanding in cases of coma, where a lesion of the central nervous system must be excluded and lumbar puncture performed, as in our two cases. It is also in such cases that an adequate history may be unobtainable and the possibility of alkalosis not considered.

SUMMARY

Two cases of alkalosis are described illustrating the severe form which this syndrome may take and the clinical features which may help in the differential diagnosis. The C.S.F. shows a diminished chloride and an increased urea content, which may assist in the diagnosis.

We wish to thank Dr. J. Dick, medical superintendent, for permission to carry out this work, Dr. C. J. Polson for some of the pathological investigations, and Dr. H. G. Garland for valuable help and criticism.

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BASAL METABOLISM IN GASTRO-INTESTINAL BLEEDING

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SEVERAL authors have expressed the opinion that there is an increased breakdown of body protein in association with the azotæmia of hæmatemesis (Sanguinetti 1934, Sučić 1935, Bookless 1938). Evidence has been obtained—loss of weight, creatinuria, and increase in the output of inorganic sulphur and phosphorus—suggesting that such a process takes place (Black and Leese 1940). Although it appeared unlikely on general grounds that there should be any corresponding increase of total metabolism, it was thought desirable to investigate the basal metabolic rate (B.M.R.) in cases of gastroduodenal bleeding. The method used was that described by Beaumont and Dodds (1939) with the Roth-Benedict apparatus. The accompanying table shows the B.M.R. and amplitude of breathing in twenty patients with hæmatemesis and melæna admitted to the wards of the Radcliffe Infirmary. In fourteen of the cases blood-urea results are also available.

The range of the twenty observations is from − 29 to + 46, and the mean is + 7, with a standard deviation of ± 17. The standard error of the mean is ± 3·8; hence the mean of the present series does not differ from the mean normal value—i.e., 0—by more than twice its standard error; in other words, the B.M.R. in the cases investigated does not differ significantly from the normal.

OBSERVATIONS ON PATIENTS WITH GASTRODUODENAL HÆMORRHAGE AND MELÆNA

Case	B.M.R. (per cent. of normal)	Amplitude of breathing (c.cm.)	Blood-urea (mg.*)	Case	B.M.R. (per cent. of normal)	Amplitude of breathing (c.cm.)	Blood-urea (mg.*)
1	− 29	400	—	11	− 8	500	—
2	− 5	450	—	12	− 5	390	48
3	+ 7	450	—	13	− 8	430	42
4	− 14	380	—	14	+ 12	500	118
5	− 1	400	—	15	+ 7	450	156
6	+ 19	580	48	16	− 1	550	69
7	+ 11	500	68	17	+ 33	350	60
8	− 4	420	50	18	+ 7	350	58
9	+ 12	430	48	19	+ 42	400	68
10	+ 18	650	66	20	+ 46	500	72

Note.—Case 15 was complicated by chronic Bright's disease.
* Per 100 c.cm.

The range of normal variation of the B.M.R. is from − 15 to + 15 per cent. (Beaumont and Dodds 1939). Fourteen of the twenty estimations thus fall within the normal range, and only three (cases 17, 19, and 20) are considerably above it. In view of the possibility that these three exceptions may represent merely a failure to attain strictly basal conditions in difficult circumstances, it may be concluded that increase of total metabolism is not of importance in causing the azotæmia of hæmatemesis. This is borne out by the absence of any correlation between the B.M.R. and the blood-urea where figures for both are available; likewise, the B.M.R. appeared to bear no relation to the general condition of the patient.

Henderson (1938) describes a close relationship in experimental animals between severity of hæmorrhage and depth of breathing and claims that the volume of breathing is of value in prognosis. In our present series of cases, although we could not obtain any direct measure of the severity of the hæmorrhage, the volume of breathing seemed to bear no relation to the level of blood-urea or to the patient's general state. Measurement of the volume of breathing thus appears to be of no value in assessing the severity of gastro-duodenal bleeding.

CONCLUSION

In gastroduodenal hæmorrhage there is no significant change in the B.M.R., and no relationship between the total metabolism and the degree of azotæmia.

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INTESTINAL ULCERATION IN MYELOGENOUS LEUKÆMIA

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Infiltration of the gastro-intestinal tract is one of the rarer manifestations of leukæmia. Considerable confusion exists in the published reports dealing with it. Cases with much infiltration have been classified as pseudoleukæmia gastro-intestinalis, which has been thought to be a distinct disease. Cohnheim (1865) first used the term "pseudoleukæmia" to indicate a disease with the features of an ordinary lymphatic leukæmia but a normal or relatively normal blood-count. These cases are now usually called aleukæmic leukæmia. Wells and Maver (1904) suggested the name "pseudoleukæmia gastro-intestinalis" for a type of pseudoleukæmia in which practically the whole of the gastro-intestinal tract showed diffuse and nodular leukæmic infiltration. They thought it was a distinct pathological entity and they described 8 cases, some of which, however, were undoubtedly Hodgkin's disease, and others probably aleukæmic leukæmia. No blood-counts are recorded in their cases. Since 1904 the condition has been repeatedly recorded, most of the cases being aleukæmic leukæmia with infiltration of the gut. Symmers (1918) states:—

"In true lymphatic leukæmia, the lymphoid structures of the gut rarely, if indeed they ever, undergo a degree of hyperplasia even remotely comparable to that found in pseudoleukæmia gastrointestinalis." In this latter condition the changes consist of "myriads of enlarged follicles stretching from the cardia to the anal margin causing great thickening and rigidity throughout. . . . with hardly a hair's breadth between the follicles."

It seems very doubtful, however, whether there is much justification for regarding this condition as a distinct pathological entity. Jaffé (1927), among others, has pointed out that aleukæmic leukæmia and leukæmia are really identical, and cases of true leukæmia with aleukæmic phases are often recognised. It does appear, however, that infiltration of the gut, although rare, is commoner in lymphatic leukæmia than in myelogenous leukæmia. Naegeli (1923) denied ever having seen any myeloid changes in the intestine. Mullern and Grossmann (1912), Schultze (1906), and Herxheimer (1913) described infiltrations of ileum and colon in myelogenous leukæmia, which were located mainly between the lymphoid follicles; occasionally a leukæmic nodule in the gut may cause intussusception, as in Hoffmann's (1907) case. One of the best reviews of the subject is by Boikan (1931), who confirms the rarity of intestinal changes and gives full reports of cases. In view of this rarity, the following case is of interest.

CASE-RECORD

A male, aged 63, was admitted to King's College Hospital on Oct. 6, 1938, with mucopurulent conjunctivitis of fourteen days' duration. He had felt weak and depressed during this time, and for the three days before admission he had been drowsy. For four weeks before admission he had had occasional bouts of diarrhœa.

Examination showed right and left mucopurulent conjunctivitis with subconjunctival hæmorrhage in the right eye. The fundi were normal. His tongue was thickly furred, and there was much sordes. The heart was not enlarged, sounds were normal, blood-pressure 112/62, pulse-rate 98, and temperature 99·4° F. The liver and spleen were enlarged and firm, and both extended 3 in. below the costal margin. There was no ascites, and no enlarged glands could be felt. The urine contained much albumin and diminished chlorides. Blood-urea was 119 mg. per 100 c.cm. on the 10th, 240 mg. on the 12th, and 288 mg. on the 13th. A blood-count on the 12th showed 2,930,000 red blood-cells, hæmoglobin 64 per cent., and colour-index 1·09. The leucocytes numbered 340,000, the great majority being myeloblasts. The Wassermann reaction was negative.

Progress.—The patient's fluid intake was good, but very little urine was passed. He was constipated until the 13th, when he had three fluid motions during the day, and it was noted that his abdomen was distended. At no time did he complain of pain. His temperature ranged from subnormal to 102·4° F. He gradually became more drowsy, passed into coma on the 13th, and died on the 14th.

Post-mortem examination on the 15th showed that the body was that of a well-nourished man. There were numerous petechiæ and ecchymoses over the trunk and arms and a tinge of jaundice in the conjunctivæ. The cardiovascular and respiratory systems were normal, apart from subpleural and subpericardial hæmorrhages. There was severe peritonitis, especially in the region of the cæcum, with a pint of turbid free fluid in the peritoneal cavity. The omentum was inflamed, and there were hæmorrhages in the peritoneum. The liver weighed 8 lb. 2 oz. and was extensively infiltrated with leukæmic deposits. The spleen weighed 1 lb. 8½ oz. and showed extensive leukæmic changes. The kidneys weighed, right 10 oz. and left 10½ oz., and both were the seat of leukæmic changes.

Alimentary canal: œsophagus and stomach normal. In the lower two-thirds of the small intestine were numerous ulcers 2–10 mm. in diameter. Most of them had a grey surface, but the larger ulcers had a shaggy blackened surface, and one at the ileocæcal junction had a minute perforation through the peritoneal coat and doubtless was responsible for the peritonitis. There was a strong smell of ammonia in the small intestine. The cæcum was normal, but the colon showed a little hyperplasia of the lymphoid follicles, although there was no ulceration. The mesenteric lymph-glands were a little larger than normal but showed no naked-eye evidence of leukæmia.

The bone-marrow was greyish red and typical of leukæmia.

Microscopically, the liver showed cloudy swelling of the liver cells, with many myeloblasts and myelocytes, mainly in the periportal zones but also between the columns of liver cells. The spleen was densely infiltrated with myeloid cells, and the kidneys showed extensive infiltration, especially in the cortex. Section through one of the ulcers in the ileum showed that the mucosa was dead, the submucosa was very much wider than normal and packed with myeloblasts and myelocytes, the circular muscle-fibres were separated from each other by œdema and myeloid cells, the longitudinal muscle coat was broken up, and the connective tissue between the longitudinal muscle layer and the mesothelial cells of the serosa was about ten times wider than normal, owing to a dense packing of myeloid cells.

COMMENTS

This case is reported because of the rarity of ulceration of the intestine in myelogenous leukæmia and the still rarer manifestation of perforation of one of these ulcers, causing peritonitis. It may be thought that the terminal uræmia of the patient contributed to the ulceration, but uræmic ulcers are usually shallow, and microscopically the ulcers in this patient appeared to be purely due to the leukæmic infiltration. The changes bear out Sternberg's (1905) contention that different grades of hyperplasia of

lymphoid tissue are associated with leukæmia, and that in some cases the process closely approaches a malignant tumour.

This case also demonstrates that extensive intestinal changes may develop in leukæmia with a typical leukæmia blood-count and suggests that pseudoleukæmia gastro-intestinalis is not a distinct disease but a manifestation of ordinary leukæmia, developing most commonly, however, in aleukæmic leukæmia. Why the gut should be particularly affected in some cases and not in others is a question that has not yet been settled.

SUMMARY

A case is described with a blood-count typical of myelogenous leukæmia. Extensive ulceration of the small intestine had developed, the ulcers being at the site of myeloid infiltration, affecting all layers of the intestinal wall. One of the ulcers had perforated, causing peritonitis. The relationship of this case to the condition known as pseudoleukæmia gastro-intestinalis is discussed.

I am indebted to Mr. J. Myles Bickerton for permission to use the clinical notes.

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REVIEWS AND NOTICES OF BOOKS

Selected Writings of Sir Charles Sherrington

Compiled and edited by D. DENNY-BROWN. London: Hamish Hamilton Medical Books, 1939. Pp. 529. 25*s*.

THE guarantors of *Brain*, as a testimonial to Sir Charles Sherrington, have here gathered together a selection of his writings edited by one of his pupils with the assistance of another, Dr. John Fulton. Sherrington's published papers are scattered through many journals, and many are now difficult to consult; they form, as the editor says, "both a classical example of scientific method and a monumental contribution to the literature of the nervous system." Beginning at the periphery with papers on the distribution of the motor and sensory nerve roots the reader passes by way of the spinal animal and spinal reflex activity to the classical work on reciprocal innervation. Then follow a discussion of decerebrate rigidity and postural reflexes and a study of stimulation of the motor cortex. Finally there is a survey of the nature of excitation and inhibition and the rôle of these processes in the intrinsic activity of the nervous system. The skilful arrangement enables us to view Sherrington's life work as a triumph of inductive reasoning of which general principles are the final fruit. The reader may find it difficult to know whether to admire more the exquisite detailed mastery of the individual observations, which has much in common with the technique of the greatest artists, or the cautious progress towards generalisations which seem finally to emerge from the facts themselves rather than to be products of the human mind. This work is a fitting tribute to the greatest living neurologist.

Fractures and Other Bone and Joint Injuries

By R. WATSON-JONES, B.Sc., M.Ch.Orth. Liverp., F.R.C.S., hon. orthopædic surgeon, Liverpool Royal Infirmary; clinical lecturer in orthopædic surgery and lecturer in the pathology of orthopædic conditions in the University of Liverpool. Edinburgh: E. and S. Livingstone. 1940. Pp. 723. £2 10*s*.

THIS is an excellent book, well arranged, well written, well illustrated, and well produced. The matter is divided into three main sections: parts 1 and 2 deal with the general principles of physiology, pathology, diagnosis and treatment, parts 3, 4 and 5 with the treatment of individual fractures on a regional basis, and part 6 with a few unusual cases. The arrangement avoids the repetition and diffuseness which are inevitable when treatment and complications are discussed at length with each fracture. The text is written in that attractive living style, and with that eye for the telling phrase, that we have come to associate with the author.

The chapters on avascular bone necrosis and on clinical and radiological diagnosis are of outstanding interest, and the sections on injuries of the spine, the shoulder-joint and the os calcis are particularly rich in helpful practical detail. The concluding chapter, on difficult cases, is a stimulating little essay in itself. In the discussion of radiological diagnosis groups of films are reproduced to demonstrate pitfalls and difficulties; in each group a flap of paper on which the problem is stated must be lifted to expose the key radiogram which solves the puzzle. This device, borrowed from the crime thrillers, forces the reader to consider the problem and makes him remember the lesson. Radiograms of fractures of the os calcis are overlaid by diagrams on a Cellophane sheet exactly registered so that the film can be studied alone or with an analysis of the deformity.

The book is written essentially for the postgraduate. It presupposes a knowledge of the ordinary teaching contained in textbooks, and deals scantily with some aspects of the subject, particularly with the signs and clinical investigation of fractures. Mr. Watson Jones has never been a champion of orthodox or accepted practice, and he is here particularly concerned in stating his personal outlook and reiterating those views which he has been bringing before his colleagues for many years. It is natural therefore that there is much in this book with which the experienced reader for whom he writes will disagree, even though he may admire the way the argument is put forward. There is a good deal of wishful thinking. Inefficient immobilisation is so much the author's particular dragon that he seems to give insufficient place to sepsis, faulty position and the interposition of soft parts as causes of delay or failure in union. The distinction between abduction and adduction fractures, which has been so invaluable in the analysis of shoulder-joint injuries, becomes a principle to be applied to all articular and juxta-articular fractures. In the femoral neck the principle becomes nebulous if not stratospheric, and it is difficult to detect any difference between the fractures in figs. 757 and 758 beyond the arrows, or to see why a careless orderly should not convert the first, which needs no immobilisation, into the second, where operation is essential. The captious reader might also find the treatment advocated for fractures of the femoral shaft archaic and in most hands ineffective, and the condemnation of traction

by the Kirchner wire, particularly in the olecranon where it has revolutionised the treatment of complicated fractures in the elbow-joint, an extreme example of special pleading.

The publishers have provided an ensemble worthy of the occasion. The figures and plates are beyond criticism. Each is good, each so apt that it must have been chosen from a large number, and each illustrates some particular point with a clarity that almost makes the text redundant; the diagrams are equally clear and have been kept commendably simple.

A Textbook of Gynæcology

(5th ed.) By JAMES YOUNG, D.S.O., M.D., F.R.C.S.E., F.R.C.O.G., professor of obstetrics and gynæcology in the University of London; director of the obstetrical and gynæcological unit at the British Postgraduate Medical School. London: A. and C. Black. 1939. Pp. 425. 16*s*.

THE three years that have elapsed since the last edition of this book have witnessed much activity in the science of sex endocrinology and its application to clinical problems. It is in the chapters concerned with the physiology of menstruation and the pathology of menstrual disorders that the greatest changes have had to be made. Professor Young has succeeded in presenting a full, clear and interesting account of the properties, constitution and relationships of the various sex hormones. He has made the fullest use of illustrations which include some extremely good photomicrographs. Readers of former editions will remember the outstanding chapter on pain in gynæcology, with its treatise on backache. Few clinicians pay sufficient attention to this troublesome symptom or appear to realise the importance of faulty posture in its production. Gynæcology is dealt with on orthodox lines; the descriptions are accurate and the text makes interesting reading. The author might perhaps have given us more details of some of the treatments he suggests for the minor ailments of gynæcology. Many of these conditions can be treated successfully without reference to a specialist.

Surgery of the Eye

By MEYER WIENER, M.D., professor of clinical ophthalmology at Washington University school of medicine, St. Louis; and TENNETT Y. ALVIS, M.D., assistant professor of clinical ophthalmology at the school. London: W. B. Saunders Co. 1939. Pp. 445. 37*s*. 6*d*.

THIS book is an excellent atlas and guide for both the practising ophthalmic surgeon and the student of ophthalmology. The illustrations of common ophthalmic operations are admirably lucid, though there are a few minor errors of draughtsmanship such as a disproportion in the size of some instruments and an inadequately dilated pupil in operations where full dilatation is necessary. The authors have as far as possible adhered to their plan of describing for each condition only a single operative method which has stood the test of time. There are several points with which some ophthalmic surgeons in this country will disagree. Thus, in the extraction of magnetic intraocular foreign bodies the posterior route is advocated and there is no mention of the technique of extraction by the anterior route, which is more commonly practised in England when the foreign body is small. In cases of complicated cataract in which the anterior chamber is shallow the authors recommend carrying the Graefe knife through the iris, capsule and lens in effecting the section of the globe. Some ophthalmic surgeons would prefer a more cautious approach by performing a preliminary iridectomy followed later by extraction of the opaque lens if the eye behaved properly after the former operation. Some of the surgical procedures recommended for retinal detachment are obsolete. The authors are unnecessarily severe when they say "one should never temporise with a perforating wound of the sclera that involves severe injury to the ciliary region even though light perception or vision be temporarily good at the time. Enucleation is positively indicated." The principle is sound but in many of these injuries it is justifiable to effect careful wound toilet, closure by scleral sutures and protection with a conjunctival flap, particularly if surgical attention is available within two hours of the infliction of the wound. Some eyes settle down well and a measure of useful sight is saved, but if the postoperative recovery is unsatisfactory during the few days after operation then excision is the proper course.

The Art of Anæsthesia

(6th ed.) By P. J. FLAGG, M.D., visiting anæsthetist to Manhattan Eye and Ear Hospital. London: J. B. Lippincott Company. 1939. Pp. 491. 30*s*.

IN this edition Dr. Flagg has added chapters on Cyclopropane and carbon-dioxide absorption, as well as references to helium and to methods applicable to cerebral and thoracic surgery. His account of endotracheal anæsthesia is incomplete. There is no mention of nasal intubation, and indeed he remarks that one of the disadvantages of endotracheal methods is "the necessity of intubation by direct vision." Moreover, he appears to be unaware of the fact that intubation with a large-sized catheter was described to the anæsthetic section of the Royal Society of Medicine as long ago as 1920 by Magill and Rowbotham. He usefully divides the physical signs accompanying stages of asphyxia in the newborn infant into three groups, the depressed, spastic and flaccid, and sets out the indications for relief appropriate to each group. There are admirable photographs illustrating bodily postures required for various surgical procedures.

The book remains, as it has always been, a good general guide to the knowledge and practice of anæsthetics.

First Aid for the Householder

By H. A. CLEGG, M.B. Camb., M.R.C.P., and I. HARVEY FLACK, M.B. Manc. London: George Newnes. 1939. Pp. 107. 1*s*. 6*d*.

WRITERS of books on first-aid have their work cut out, in these hard times, to give the same old facts a festive air. Any victim of blackout driving will notice how closely British citizens have studied their first-aid primers and how purposefully they put their knowledge into action. Dr. Clegg is particularly good at presenting facts cheerfully, as readers of "Brush Up Your Health" will remember; like a good cook, he has a light hand and knows how to combine even the stalest ingredients into something nicer than a re-hash. In this little book he and his collaborator have succeeded in making first-aid easily memorable as well as intelligible; reasons are given as well as directions. The introduction is reassuring and the thumbnail sketch of anatomy and physiology—occupying about four pages—a lesson in what to leave out. The material is as usual concerned with the first-aid treatment of accidents, wounds, fractures, burns, poisoning, drowning, and minor ailments, but there is also a concise and calming section on gas and gas casualties. A few nursing hints—not quite enough of them—and a list of first-aid equipment end a useful book. The illustrations, particularly the one of identical twins displaying the grip for a four-handed seat, have a charm of their own.

THE LANCET

LONDON: SATURDAY, JANUARY 27, 1940

A MEDICAL SERVICES LIBRARY IN FRANCE

THE Royal College of Surgeons of England has already initiated two useful services. One of these is the Army blood-transfusion unit under the direction of Dr. L. E. H. Whitby at Southmead Hospital, Bristol. The other is a research laboratory in France with the pathological curator, Dr. L. W. Proger, in charge and twelve of the college staff engaged there or stationed in the neighbourhood. Colonel Beattie, the conservator, who is the moving spirit of the whole, has reported that the unit in France is handicapped by the lack of current medical and scientific periodicals, with the result that the staff are unable to keep in effective touch with work being done elsewhere. The college has now decided to found a reference library in connexion with this unit, and to make it available to all officers in the medical services in France. The first instalment of books and periodicals has now been sent out. It should be possible to use the library as a regular clearing-house of information as well as to answer medical questions put by medical officers on active service. This may go a little beyond the thought of the promoters but the possibilities of such a scheme are very great and should be envisaged on the grand scale.

THE COMMON COLD

ANY discussion of the common cold must be on insecure foundations since knowledge of its pathogenesis is lacking, but we are not so ignorant about the disease as the popular press supposes. Colds are certainly air-borne and the vehicle is condensed droplets of infected nasopharyngeal secretion. No specific organism has been isolated, but a filtrable virus seems likely to be responsible. The portal of entry into the body is the nasal mucous membrane, the actual invasion taking place either through minute abrasions in the surface or by absorption through the intact cell membrane. After passing through the epithelium the infection is disseminated locally by the submucous lymphatic network to the adjacent mucous membranes of the sinuses and pharynx, and generally from this network into the bloodstream. The invasion is followed by local hyperæmia and an outpouring of secretion from the mucosa. Toxic symptoms accompany the general spread. Secondary invasion by other organisms which are normally present in the respiratory tract or are also air-borne nearly always occurs, and it is hard to say which symptoms and signs are due to the primary and which to the secondary infection, especially as the primary one cannot yet be experimentally reproduced. The subsequent course depends on the nature and virulence of the secondary infection. As a rule the serous nasopharyngeal discharge becomes mucoid and often mucopurulent as the usual defensive mechanism is brought into action. If this is successful the changes are reversed until a cure results. The physical expression of the process of inflammation is swelling of the mucous membrane, and this, by partial or complete occlusion of their orifices, may interfere with the drainage from the sinuses and delay local resolution. The body destroys the circulating virus, organisms and toxins in its usual way by the reticulo-endothelial system.

If everyone with a cold was isolated in the early stages the incidence could undoubtedly be lessened, but colds are usually not sufficiently disabling to make isolation seem worth while and public opinion accepts them as part of life's normal routine. Preventive treatment with mixed stock or autogenous vaccines still has its advocates in spite of the weight of evidence against them, and they may perhaps so reduce the more distressing symptoms due to secondary bacterial invasion that the primary infection passes unnoticed. The liability of different people, and of the same person at different times, to catch cold is so variable that it is almost impossible to assess the value of any form of preventive therapy.

During the stage of general invasion and inflammatory reaction the usual treatment of an acute infection—namely, complete rest—is the logical procedure. Unfortunately again public opinion is not prepared for radical measures, and most patients refuse point blank to be confined to bed unless their cold is very severe. Short of this the bodily resistance can be increased by concentrated preparations of vitamins A, B, C and D and a good full diet—the ancient saw "feed a cold" is sound modern therapeutics. The growing habit of prescribing the sulphonamides indiscriminately is to be deplored unless it is clear that a streptococcal or pneumococcal secondary infection is present. These drugs are not free from risk and their toxic symptoms may be more unpleasant than those of the disease, especially if the patient remains up and about. The inflamed site of the primary infection is best treated with heat—perhaps with infra-red ray or short-wave therapy—and with steam inhalations conveying a mild and transitory vasoconstrictor such as menthol in small doses, which allows the fomenting action of the steam to reach the more remote sinuses. It is irrational and probably harmful to use powerful and long-lasting vasoconstrictors since hyperæmia is a necessary part of the natural resistance to infection. In addition, it is essential to use no drug which will hinder ciliary action, for on this depends the removal of secretion thrown out by the inflamed mucosa. Inhalants or local applications containing ephedrine or the like should therefore be avoided in the early stages; their sole use is in cases where the initial acute phase is over and an infected accessory sinus is draining badly. The repeated application of astringents may give temporary relief, but it must be at the expense of the local processes of resistance.

FORGETFULNESS

AMNESIA has a conspicuous place among the symptoms which come into their own during a modern war. As Major ROSIE has pointed out,[1] amnesia is frequent in the Army, even in peace time, and simulated amnesia has at times been found a convenient excuse by a soldier charged with some military offence. There is, of course, no reason to suppose that when a man becomes a soldier he puts on hysteria or malingering with his new uniform; but amnesia was a common symptom among the neurotic soldiers of the last war, and in the masses of men who make up an army and live under conditions in which the influence of suggestion is especially favoured, there are likely to be many, already prone to use hysterical mechanisms, who readily have recourse to amnesia, professed or genuine, when in difficulties. The mental functions concerned in excluding knowledge from our recollection are now a familiar part of psychology: "repression" and "buried memories" are often seen even in the headlines of the daily press. As the notable studies of Professor BARTLETT [2] have indicated, it is as necessary to look into the factors concerned with remembering as into those of forgetting, but physicians will always be inclined to pay more attention to the latter since mild amnesia is so common a symptom in everyday practice. It is not only hysterical amnesia that the physician meets; there are many other forms, those following damage to the brain being perhaps the most striking.

ABELES and SCHILDER,[3] in their analysis of 63 cases of psychogenic amnesia, were able to show that either physical or psychical trauma had precipitated the amnesic episode, but that there were always more significant troubles of an intimate kind in the background, and that in general it was when some change in a long-standing disagreeable situation became imminent that the amnesia would supervene. The degree of amnesia varied in their cases, and was seldom total; various writers have sensibly but vainly proposed that we should substitute "hypomnesia" for "amnesia." SCHILDER and ABELES found that half their patients recovered their memory without medical help, often quite suddenly; intensive psychotherapy was not called for to correct their failures of memory, though it was recognised that the therapeutic task had not been completed when the amnesia disappeared. The patient had still to be given insight into his problems and emotional conflicts, and protected against further lapses.

The forensic aspects of amnesia are many. It is a common defence plea, and much legal as well as medical effort is expended in differential diagnosis—as between epilepsy, for instance, and hysterical dissociation or head injury—and in deciding how far the amnesia is "genuine" or "simulated," and whether the accused was responsible for what he did during the period of which he now has no recollection. The distinction between deliberately simulated amnesia and other varieties may be an impossible one to draw, but there are some points worth considering.[4] An independent history which checks the patient's story, a past history of psychopathy, the nature of the amnesia (whether, for example, it is retrograde or not), the manner in which it clears up, the patient's behaviour and attitude towards the crime just before, during and soon after it—all these may be significant data, but it is always necessary to bear in mind that if the amnesia be hysterical the indications may be such as would also be found in a simulated amnesia. We are still far from being able to assess with certainty the degree of clear consciousness which accompanies any action of another human being. And this is, after all, the only real psychological difference between hysteria and malingering which the psychiatrist can see, unless he turns moralist and sets about discussing foreknowledge and free-will. None the less, the treatment he advocates will depend upon his assessment of whether there are deliberate and conscious motives at work when a man forgets something which it is to his advantage to forget.

1. Rosie, R. J., *Jour. R. Army med. Cp.* November, 1939, p. 293.
2. Remembering. By F. C. Bartlett. Cambridge Univ. Press. 1932.
3. Abeles, M., and Schilder, P., *Arch. Neurol Psychiat.* 1935, **34**, 587.

VISITING IN CHILDREN'S WARDS

THE authorities of the Ayr county hospital have forbidden visitors to its children's wards, and now when so much additional accommodation for sick children is being organised in the reception areas the question of visiting needs facing everywhere. The practice in London is variable. At one large teaching hospital visiting the children's ward has been forbidden since many years before the last war, but this is combined with a policy of easy access to the ward door which is highly successful. On the other hand, at a children's hospital visiting was stopped for a time but the authorities then went back to their old rule on the lines of adult hospitals.

The obvious disadvantage of allowing visitors to children's wards, and this is the reason put forward at Ayr, is the risk of introducing infection. A good case can be made out for forbidding child visitors, and the practice of providing gowns and caps for visitors, as is done at many fever hospitals, might also be considered. But if droplet infection is to be satisfactorily prevented a mask would have to be added, and such fancy dress would not be appreciated by some child patients. An alternative, which is already employed in schools in a different connexion, is to make visiting parents sign a certificate that they have not to their knowledge been in contact with any infectious disease within a prescribed period. This would not necessarily exclude the mother with a "streaming" cold, but she might be spotted if all visitors were interviewed by a nurse before being allowed into the ward. The psychological and emotional effects of visiting are as important as those due to infection. Anyone who has worked in such a ward knows how often

4. Hopwood, J. S., and Snell, H. K., *J. ment. Sci.* 1933, **79**, 27.

a child settles down a few days after admission, only to be upset again and again by the parents' visits. It is a fact to be faced by all parents that with few exceptions no child mopes in a children's ward, and in a few days the young child, at any rate, cheerfully adopts the nursing and medical staff *in loco parentis*. The child does not need visitors in the same way as does the adult patient, and this means that any visiting that is done is for the benefit of the parents rather than of the patients. If this is accepted it is surely logical to forbid visiting altogether.

If no regular ward visiting is allowed parental distress must be alleviated by allowing access to the ward door at any time, which is the rule at the teaching hospital already mentioned. Interviews there with the sister, the resident house-officer, and often the visiting honorary staff, supplemented by a peep through the ward door have been found to relieve all anxiety. A brief visit to the bedside at night when the child is asleep may be needed to soothe the over-anxious mother, and when a child is dangerously ill visiting can be allowed freely if the child is put in a remote corner of a ward, surrounded by screens, or better still in a side ward. Some will still call the policy of exclusion hard-hearted, more especially those who know least about the child's mind and how it works in hospital, but infection in a children's ward can be devastating and deadly, and sentiment is not a weighty enough argument to set this risk aside.

ANNOTATIONS

ACNE STILL UNEXPLAINED

ACNE affects young adults at an impressionable age, and the disfigurement it produces often has a deep significance that is not always appreciated. Spotty-faced boys or girls may be undergoing acute mental anguish, regarding themselves as outcasts and not wishing to mix with their fellows, and this background may be the basis of a lifelong psychological disorder. Fortunately this is not always the case, for many young people bear their affliction with remarkable fortitude, in spite of parents who tend to regard such a disfiguring manifestation in their offspring as a reflection on themselves. "I can't understand it," says the mother in injured tones, "I always had the most perfect skin." For these reasons and because the disorder is common much time has been spent by dermatologists in seeking the cause. Focal infection, allergy, and disordered metabolism of fats, carbohydrates and the halogens, among many other factors, have been blamed in turn, but the true ætiology is as obscure as ever.

Lately, following the prevailing fashion, it has been suggested that acne is related to endocrine disturbance. This view is based on the fact that the condition begins at puberty and usually ends with sexual maturation, and on the observation that exacerbations sometimes appear at the menses. From this point of view Lynch[1] has studied a large group of students, aged 17–21, at the University of Minnesota. Among students specially examined on entrance to the university he found that boys were more often affected than girls and that the incidence increases with age. There were more severe cases among the older students, and this suggested but did not prove that severity is related to the duration of the disease. The trunk was involved more often in boys than in girls, but in both sexes the face was the commonest site. The course of the disease was always irregular and in the girls of this series exacerbations did tend to be associated with the menses. No relationship was found between body build or body weight and acne. An increased basal metabolic rate was twice as common when the trunk was involved as when the face alone was affected, and the more severe cases had an increased rate. The incidence of abnormalities of menstruation was roughly the same in girls with and without acne. The texture and colour of the hair was found to have no bearing on the disease. Boys were found to have seborrhœa more often than girls and in both sexes seborrhœa was more common among those with acne, especially when the acne was severe. The girls without acne washed their faces less than those with it, but in boys there seemed to be no association between acne and washing. The incidence of constipation in all the cases observed was negligible. The effect of endocrine therapy was studied in a large number of cases with ample controls and proved to be valueless. As a result of this extensive survey Lynch concludes that there is no real ætiological connexion between endocrine imbalance and acne, so that another promising theory has gone the way of its predecessors.

1. Lynch, F. W., *J. Amer. med. Ass.* 1939, **113**, 1792.

IS THERE A LAW OF DENERVATION?

MANY of us can remember being told as students that the most sensitive test for small quantities of adrenaline—such as might be liberated into the blood by the suprarenal—was the response of the denervated heart or iris. This was not different in kind from the response of the innervated muscles, but occurred at very low concentrations. Although the fact excited transient interest, no explanation of why denervation should have this sensitising action was forthcoming. But the observation itself explained why subjects under stress of emotion exhibit dilatation of a pupil in which the dilator is "paralysed" while the normal pupil remains unaffected, for adrenaline, discharged into the circulation, acts more strongly on the denervated than on the normal dilator muscle.

Forty years before the description of this paradoxical dilatation, a curious phenomenon had been noticed in the paralysed tongue. Stimulation of a nerve (the lingual) which did not innervate the musculature at all, though it contained fibres supplying blood-vessels, sent the denervated muscle into a contracture. It had no effect on the normal tongue. Recent work has disclosed an analogy between these phenomena. It is supposed that pupillo-dilator fibres normally excite the muscle by causing the local discharge upon it of small quantities of adrenaline, or a like substance. Similarly, there is evidence that voluntary muscle, such as that of the tongue, may receive its stimulus from the motor nerve fibres in the shape of small charges of acetylcholine. Just as removal of its nerve renders the dilator of the pupil hypersensitive to circulating adrenaline, so denervation of the tongue may increase its sensitivity to acetylcholine. In this condition, acetylcholine liberated on the local blood-vessels by their own nerves, and normally insufficient to excite the striped muscle, finds the latter in an abnormally excitable condition.

Prof. W. B. Cannon[1] of Harvard has now emphasised this analogy, and with the aid of his colleagues added other examples of the same kind of thing. Not content with this, he argues that just as the postganglionic autonomic and motor somatic fibres innervate their effector organs, so they themselves are "innervated" by preganglionic and intraspinal fibres. This is plausible, and there is certainly evidence that ganglionic transmission may be through the medium of acetylcholine. Cannon declares that section of preganglionic fibres sensitises the postganglionic fibres to the action of this substance. In the same way, in hemisection of the spinal cord, he says that on the side of the section the motor neurones are more susceptible to the action of convulsants such as strychnine than their fellows of the normal side. The generalisation emerges, then, that a structure normally receiving nervous impulses becomes hypersensitive to chemical substances when the source of these impulses is removed. It is possible, for instance, that Jacksonian epilepsy is due to an abnormal sensitivity of cortical cells on account of fibres making contact with them having been destroyed. Cannon is deeply committed to the theory of humoral transmission of nerve impulses, although, as was recently pointed out in these columns,[2] electrical transmission is by no means excluded in autonomic ganglia and is widely accepted as the most likely method in the central nervous system. This should not blind us to the fact that the experiments in support of the "law of denervation" are really independent of any theory of transmission and must be examined on their merits. They cannot yet be regarded as conclusive, particularly those dealing with the central nervous system, but Cannon has made out an excellent case and put forward a stimulating idea. In his own words, "Here is work to be done."

AURICULAR STANDSTILL

ESSENTIALLY an electrocardiographic diagnosis, auricular arrest, or auricular standstill as the Americans prefer to call it, is a rare clinical finding, though it is commonly produced experimentally in animals by digitalis or quinidine intoxication. The electrocardiogram is usually typical: there is no evidence of auricular activity and the ventricles beat with an independent regular rhythm, the ventricular complexes being of the supraventricular type. Differentiation from nodal rhythm is sometimes difficult, and care must be taken to exclude those cases of auricular fibrillation with a slow ventricular rate where there may not be much evidence of auricular activity. There were 8 definite cases of auricular standstill at the Peter Bent Brigham Hospital in the last ten years, and 4 others in which the diagnosis was almost certain. Rosenbaum and Levine[3] found, curiously enough, that the same number of proven and probable cases have been recorded elsewhere. The condition most often affects people between 50 and 70, where it is associated with serious heart disease and congestive heart failure. Its prognostic significance is serious, for 5 out of the 12 cases at the Peter Bent Brigham died in hospital and another 2 within a short time of being discharged. The important ætiological factors are undoubtedly digitalis and quinidine. Of the total of 24 recorded cases, 12 had received digitalis and 7 quinidine. The practical application of this fact is obvious. In elderly people with severe heart disease and congestive heart failure the administration of digitalis and quinidine should be carefully supervised, and wherever a diagnosis of auricular arrest is made digitalis and quinidine should be stopped immediately.

Among the cases reported from Boston is one of a boy of sixteen who had diabetes and appendicitis, a "probable" diagnosis of auricular standstill being made on an electrocardiogram taken because of an irregular cardiac rhythm. An electrocardiogram taken twenty months later was essentially normal. Unfortunately no details of this case are given, but it raises the question what ætiological factors other than digitalis and quinidine may be concerned. In animals auricular standstill can be produced by asphyxia and by bilateral ureteric ligation as well as by the digitalis group, and there is also evidence that it can be produced by large doses of potassium salts. Since both asphyxia and bilateral ureteric ligation are accompanied by an increase in the serum-potassium level, the question arises whether the auricular stoppage is due to this rise in potassium. Should this be so, the close association between acetylcholine and potassium suggests the possibility that in man auricular arrest may result from vagal overactivity.

1. Cannon, W. B., *Amer. J. med. Sci.* 1939, **198**, 737.
2. *Lancet*, 1939, **2**, 1324.
3. Rosenbaum, F. F., and Levine, S. A., *Amer. J. med. Sci.* 1939, **198**, 774.

CHEMOPROPHYLAXIS OF SLEEPING SICKNESS

SINCE biological immunisation of man against sleeping-sickness seems impracticable it is not surprising that the prophylactic power of various trypanocidal drugs has been examined. The trivalent aromatic arsenical compounds are useless for this purpose because they are so rapidly excreted, as shown by the experimental work of Murgatroyd, Russell and Yorke[1] while the quinquivalent compounds, although they render the blood trypanocidal for longer periods, also have several disadvantages in practice. Not the least of these is that if an infection does become established there is grave danger that it may be the starting-point for the development and dissemination of arsenic-resistant strains, for, as Murgatroyd and Yorke[2] have clearly proved by a long series of experiments, not only may trypanosomes exposed to aromatic arsenicals readily become arsenic-resistant but such resistance may persist indefinitely and survive several cyclical transmissions through the tsetse fly.

With Antrypol, or its equivalent Bayer 205, the position is somewhat more promising. A single dose confers a trypanocidal power on the blood for a long period. Resistance of trypanosomes to it is also acquired much more slowly and disappears much more readily than is the case with the arsenical preparations. Finally, the drug is effective not only against gambiense but also against rhodesiense infections which are refractory to arsenicals. It is generally assumed that its prolonged trypanocidal action is due to its long retention in the body, and it might be thought that the drug is retained in the blood-stream because of its large molecular size. The disappointing results in the treatment of the later stages of sleeping-sickness with the drug seem to suggest that it cannot pass the blood-brain barrier, and the albuminuria with casts which not infrequently follows its administration might be explained by assuming that the kidney meets with similar difficulty in its elimination. Boursnell and Wormall,[3] in a recent study on its retention in the body, point out, however, that the molecule is not really so big that it would not be excreted by the kidney, and in fact there is evidence that appreciable quantities are excreted in the urine during the first few days after injection. Nevertheless, a considerable amount is retained, and they conclude that although

1. *Ann. trop. Med. Parasit.* 1934, **28**, 227.
2. *Ibid*, 1937, **31**, 165.
3. *Biochem. J.* 1939, **33**, 1191.

some of the drug combines with the tissue-proteins the significant factor in its retention in the body is its combination with the proteins of the blood and particularly with the plasma globulin. A number of observations have been made on the effect of this compound as a prophylactic agent against sleeping-sickness. Van den Branden,[4] [5] concluded that it protected for several months and Duke[6] found that a single intravenous dose of 1 g. protected man against the bites of tsetse infected with *Trypanosoma rhodesiense* for at least 113 days. He recommended therefore that the dose be repeated every three months, which agreed with the opinion of Mayer.[7] Although the drug may be valuable in certain circumstances for individual protection, a number of questions, such as cost, difficulty of repeated intravenous injections and their ultimate effect on the host, would have to be resolved before its use in the control of sleeping-sickness could be considered on a large scale.

CREATINE, CARBOHYDRATE AND EXERCISE

SINCE Folin in 1904 showed how to estimate creatine and creatinine accurately it has become generally accepted that creatinuria is usual in both sexes during childhood, but that with increasing age it occurs only in females and in cases of complete starvation, diabetes, Graves's disease and certain myopathies. Recent observers have raised the age at which it is normal in males. Rose in 1911 and Harding and Gaebler (1922) put the upper limit at 16, Light and Warren (1934) at 19, whilst Djen and Platt (1934) found it in adult Chinese males and Taylor and Chew (1936) in students and laboratory workers between 20 and 34, the amounts excreted increasing after exercise and diminishing on resting. Folin (1905) noted that the creatinine output for a given individual was constant and independent of the amount of nitrogen excreted in the urine and that the "creatinine coefficient" (the creatinine in mg. excreted per day per kg. of body-weight) was lower in the obese. Later Shaffer noted in a large number of people that the output seemed to be directly proportional to their muscular development. Hobson[8] has now investigated the daily excretion of creatinine and creatine in ninety-seven men of ages ranging from 19 to 30, attending a nine months' course at the Carnegie Physical Training College, Leeds. The men were carrying out a fixed routine of physical activity including gymnastics, swimming, athletics and team games and were given 4200 calories per head daily (the standard being 3500). The diet appeared to be adequate from the point of view of animal protein and vitamin content, besides containing large quantities of readily assimilable carbohydrate. Since most students showed an increase of weight during the year, the diet was apparently adequate for energy supply. The investigation showed a higher daily excretion of creatine in males than has hitherto been recorded; indeed, creatinuria occurred in all but one of the subjects. An attempt was made to find out whether this high output was due to high carbohydrate intake or to hard intermittent work severe enough to lead to oxygen debt several times a day. Twelve men were put on a low carbohydrate diet, the intake of meat and vegetables being increased to try to keep the total calories at the usual level. None of the subjects showed a positive test for acetone bodies while on this diet. It became difficult for them to perform their routine duties, as fatigue came on early, and one man collapsed and had to rest in bed. All seem to have objected to the diet and to have developed a craving for sweet things. In three cases creatine disappeared from the urine by the fourth day, and in all but one it decreased. The output of creatinine was substantially constant. The decreased physical exercise due to sheer inability complicated the results, but they do seem to show that a diet rich in readily assimilable carbohydrate is associated with creatinuria, which is quickly reduced after a change to a low carbohydrate diet.

4. *Ann. Soc. belge méd. trop.* 1926, **5**, 175.
5. *Ibid*, 1927, **6**, 147.
6. *Lancet*, 1934, **1**, 1936.
7. *Arch. Schiffs- u. Tropenhyg.* 1928, **32**, 528.
8. Hobson, W., *Biochem J.* 1939, **33**, 1425.

OUR WONDERFUL FORBEARS

FROM the time of its discovery at 4 P.M. on Dec. 2, 1929, until the death of Davidson Black in 1934 the Peking skull remained as a well-attested document in the history of man rather than as a subject round which interesting, though perhaps fanciful, speculations could be woven. Now with the help of the Cenozoic research laboratory at the Peiping Union Medical College we learn that Peking man was "responsible for such terrible acts as manslaughter of women and children and cannibalism. . . . There remains no other choice but to assume that the *Sinanthropus* population of Choukoutien had been slain and that subsequently their heads were severed from the trunk, the brain removed and the limbs dissected." The mystery of Choukoutien is ever deepening, for in the "upper cave" there was buried, with the full ritual of red ochre, a "family" of seven upper palæolithic people: two adult males, two adult females, one adolescent, a child and a baby. Perhaps, we are told, the family was that of a hunter who had his headquarters either within or at least near the cave. On the other hand it is also possible that the family was migrating on the search for new living centres. This family had also been slain. But the most remarkable thing about this remarkable family is that the three adults whose skulls are sufficiently intact to permit a satisfactory examination "typify three different racial elements, best to be classified as primitive mongoloid, melanesoid and eskimoid types. So far the most recent publications of Prof. Franz Weidenreich take us. But in collaboration with Dr. G. H. R. von Koenigswald of Bandoeng new light is thrown on the Peking man, for it is shown[1] that *Sinanthropus* and *Pithecanthropus* "are related to each other in the same way as two different races of present mankind." During the controversy that raged over the Piltdown skull it was noteworthy that, when the features of the mandible did not accord with the conception that some writer had formed of the skull, no hesitation was manifested in rejecting it from any association with the rest of the fragments. In the same way this latest dictum concerning *Pithecanthropus* and *Sinanthropus* is admittedly arrived at only by divorcing the Trinil femora (of which there are now six examples) from any association with the skulls. Perhaps speculation has now gone as far as is desirable and we may look forward to a period of quiescence during which these very important, but very fragmentary, specimens will again assume their place as documents; whose precise significance awaits the discovery of more evidence of the same kind.

Let us now turn to the survey of the scope and limitations of physical anthropology given by Prof. W. E. Le Gros Clark, F.R.S., in his presidential address to section H of the British Association meeting at Dundee.[2] No-one reading it and trying to master its technicalities can fail to grasp the fact

1. *Nature*, Dec. 2, 1939, p. 926.
2. *The Advancement of Science*, October, 1939, p. 52.

that the science is not at present really able to dogmatise in the way that some of its exponents claim. Nor is it clear that some of them are not deceiving themselves in thinking that the last word has been spoken. Take, for instance, a subject of general interest like the possibility of recognising the sex of a skeleton. Long ago Eugene Aram, in his able self-defence at his trial, said that it had not even been proved that the skeleton of his presumed victim was that of a male. That was nearly 200 years ago and yet, as Le Gros Clark points out, only yesterday two professional anatomists examined 264 skeletons independently and could only agree as to the sex in 78 per cent. Even that sheet anchor of the anthropologist, the cephalic index, seems no longer secure, for though the shape of the head is certainly determined in part by heredity there is evidence that it may be modified by postnatal influence—a fact that may give some little hope for the future to statesmen. In the same way the lecturer pointed out how many of our cherished beliefs about the value of characters distinguishing human from simian fossil skeletons are having doubt thrown upon them. It is a little disheartening, no doubt; but since it seems to be true, it is all to the good. The palæontologist, however, may be consoled by the reminder that he and his successors only need to exercise patience until the required evidence comes their way. Le Gros Clark goes on to point out how important the study of man as he is today should be to the physical anthropologist, not only in the laboratory, the dissecting-room and the mathematician's study, but in the field, the barracks and the school. How the effects of nutrition, climate, liability to disease—indeed all the influences forming environment—are really his province. Many of these, however, are already being studied by workers who do not call themselves anthropologists. The science of physical anthropology has contributed much to our knowledge of the past history of the human species, and Le Gros Clark thinks it has a still more important function to fulfil. The study of modern populations may make it possible to control in some measure the dstiny of mankind in the future.

HYDATID CYSTS OF THE LUNG

HYDATID disease of the lung, a rarity in England, holds a much more important place in Latin America; so much so, that Ivanissevich [1] of Buenos Aires recommends that in "parasite areas" every child of school age and every patient who consults a doctor for any ailment should be subjected to routine radiological examination of the lungs. In no disease is early diagnosis of greater importance. Early recognition of a pulmonary hydatid enables treatment to be carried out under the most favourable conditions, before complications have arisen which greatly increase the gravity of the prognosis; and only by radiography is it possible to make a diagnosis in really early cases, many of which are symptomless. Radiography also enables the cyst to be exactly localised prior to operation. The only cases in which complete cure can be expected are those in which the cyst is still closed—i.e., has not perforated into a bronchus. If perforation has taken place, a permanent cavity always remains, lined by epithelium which spreads in from the bronchus. Surgical treatment offers the only prospect of cure, and is indicated in all cases of "closed" hydatid cyst situated not more than 2 cm. from the surface of the lung. It is urgently required for the drainage of suppurating cysts whether central or peripheral. Central cysts communicating with a bronchus are best left alone unless there are general signs of inadequate drainage, severe cough or repeated hæmoptysis. The exact operation to be done naturally varies with the conditions present. In exceptional cases where an entire lobe is riddled with cysts lobectomy may be the procedure of choice; in the ordinary case removal of the cyst is indicated. Excision of the cyst may be carried out in one or two stages, the essential points being complete removal of the parasite and avoidance of injury to the adventitial covering. Ivanissevich is an enthusiast for the one-stage operation in a free pleural cavity, preceded by gradual induction of a pneumothorax. The preliminary pneumothorax prevents disturbances of respiration and cardiac action and enables the surgeon to explore and operate on the lung with a maximum of ease and a minimum of shock, and to deal if necessary with multiple cysts at a single sitting. That the disease is a serious one is shown by the fact that the total operative mortality in the author's series of 92 cases is 18 per cent., a figure which reinforces his plea for early diagnosis.

1. Ivanissevich, O., *Bol. Inst. Clin. quir., Buenos Aires*, 1939, **15**, 497.

REACTIONS AFTER BLOOD-TRANSFUSION

THERE is now much scientific exactitude about the practice of blood-transfusion but unexplained reactions are not yet extinct. They are caused either by incompatibility of the blood or by foreign material introduced along with it. Disturbances in which the recipient becomes agitated, shivers and sweats, complains of severe lumbar pain, or shows signs of circulatory collapse are caused by faulty grouping. The final picture in this catastrophe includes albumin and hæmoglobin in the urine and later anuria, the patient dying of renal insufficiency. Pathologists usually explain this sequence on mechanical grounds, particularly if the urine is acid, but there is experimental evidence that spasm of the renal vessels may play a part and it is said that a prompt switch-over from the incompatible to compatible blood may relieve the spasm and save the patient.[1] Wrong grouping, however, should never arise and it can be avoided by insisting that the seemingly simple test is done only by the experienced and that both sides of the serum-corpuscle equation are always solved, for when large quantities of blood are given there is the danger that a high titred donor serum may agglutinate the recipient's red cells. Apart from errors of technique incompatibility seems to account for certain reactions which arise, particularly in patients with chronic medical illnesses, even when every care has been taken in grouping. Landsteiner's agglutinogens probably play no part in unexplained upsets but they remind us that we may be still ignorant of many subtler differences in the composition of human red cells. More common are the reactions caused by foreign matter, whether it be sterilised protein or living organisms. In stored blood the chances of contamination are great, and if the temperature of storage inhibits rapid growth many bacteria survive and multiply at 2–4° C. Infection with pathogens from transfused blood is fortunately rare, though syphilis and malaria crop up from time to time and lately there have been reports of a *Staphylococcus aureus* septicæmia and an encephalitis transmitted from a donor incubating varicella. But it is pyrogenic rather than pathogenic material which causes the milder symptoms, and some American writers suggest that if we look carefully we shall find that as many as half our transfusion patients suffer in this way.

1. Kleyntjens, F., *Le Scalpel*, 1939, **52**, 1699.

In tracing these disturbances it must be remembered that the diluting fluid is sometimes at fault and sterile saline is not invariably innocuous. Most patients can readily cope with a few air or skin organisms introduced into the blood-stream but there is no doubt that they are often the cause of a rise in temperature. Sometimes stored blood is heavily infected even when its appearance seems unchanged, and it is for this reason, among others, that many people distrust the commonly accepted view that a normal colour means a normal blood. Because little serious consideration is usually given to the sterility of stored blood and because adequate and repeated testing is technically hazardous there has been search for a bacteriostatic or bacteriocidal substance which could be safely added to the blood. Quinine hydrochloride is said to be effective against the *Treponema pallidum* but the work is still in the experimental stage. Novak[2] has used sulphanilamide and he believes that 20 mg. per 100 c.cm. of blood ensures complete bacteriostasis of the common contaminants. He studied its effect on *Staph. albus*, *Pseudomonas æruginosa* and a hæmolytic spore-bearer, and it is noteworthy that these organisms are among those on which it is difficult to show that sulphanilamide has much effect. Novak's plea, however, for more serious consideration of the sterility of stored blood is just and his experiments point to a need for further work. It cannot be too often said that intravenous therapy requires absolute sterility and that any method which does not guarantee sterility is working on the brink of disastrous negligence.

INDIRECT EXTERNAL HYSTEROGRAPHY

Fenning, Denis and Adair[3] have lately studied uterine action by means of an ingenious electrical apparatus. The physiological behaviour of the myometrium under normal, as well as under artificial conditions, has not escaped the attention of investigators in the past. The simple experiment of pharmacological stimulation of the isolated uterine muscle strip is as familiar to the second-year medical student as it is useful for the assay of oxytocic drugs; but the scope of such an experiment is limited by its artificial isolation. The next development in the study of uterine action was worked out by the insertion of a small rubber bag within the uterine cavity, the bag being connected to a sensitive recording tambour. Chassar Moir[4] employed this means for correlating the apparent response to various oxytocic drugs, notably ergometrine. This method, however, is open to the criticism that the insertion of any foreign body into a hollow viscus initiates per se a response which it is difficult completely to divorce from that of other external or internal stimuli. Obviously the ideal method will be one worked on a principle analogous to that underlying the operation of electrocardiography; for here the uterus is operating in its natural environment under basal conditions, and unstimulated by external influences.

Briefly the method of Fenning, Denis and Adair is as follows. A specially designed electrode, consisting of a metal plate 5 by 11 cm., is placed 2–6 cm. from the anterior abdominal wall, and this plate is connected to a sensitive string galvanometer, which measures the displacements of the anterior abdominal wall and indirectly those of the subjacent uterus. It follows that the uterus must be an abdominal organ, as in pregnancy, for the purposes of such an experiment, but, since it is the behaviour of the gravid organ that most interests us, this need be no criticism. The interpretation of the record obtained must take into account the various components which severally unite to produce a deflection in the instrument. These are respiratory excursions, easily recognised by their regular rhythm which can be synchronised against a separate tambour recording from the chest; voluntary movements, such as a sigh or talking; uterine activity itself, such as the contraction of labour, interpreted subjectively as a pain; gastrointestinal activity, such as the movement of gas, felt or heard as borborygmi; and transmitted arterial pulsation. Fœtal movements must also be taken into account; apart from the easily recognised kicks, jabs, or "buckings," intrauterine fœtal respiratory movements, hiccoughs, and the fœtal heart must not be forgotten. By a process of exclusion, and by checking the record against that simultaneously obtained by the insertion of an intrauterine bag, some illuminating readings have been obtained and illustrated. The graphs clearly show the normal painless antepartum contractions of the uterus; the presence or absence of fœtal components proves or disproves the life of the fœtus; and the response to oxytocic drugs is prettily demonstrated.

The possibilities of this convincing piece of work are inestimable. Here, at least, is a means of further investigating that most inscrutable organ in an inscrutable organism. Perhaps here we have a scientific approach to the investigation of the obstetrician's enigma, primary uterine inertia. If it be the hormones that are at fault, here is a means of assessing their activity; if calcium deficiency is to blame, the response to the exhibition of this drug can be demonstrated, and lastly the stimulation or inhibition of the myometrium by nervous control can be measured.

2. Novak, M., *J. Amer. med. Ass.* 1939, **113**, 2227.
3. Fenning, C., Denis, M. E., and Adair, F. L., *Amer. J. Obstet. Gynec.* 1939, **38**, 679.
4. Moir, C., *Brit. med. J.* 1932, **1**, 1022.

Prof. HARRY STOBIE, dean of the Royal Dental Hospital, has been appointed consulting dental surgeon to H.M. Forces at home. This is the first time such an appointment has been made.

Prof. A. V. HILL, F.R.S., has accepted the invitation of the Cambridge University Conservative Graduates' Association to be their candidate in the forthcoming parliamentary university by-election. He will stand as an independent conservative. It is understood that Prof. J. A. RYLE may also stand as an independent progressive, and Mr. PATRICK RANSOME has been adopted as federal union candidate.

At the request of the Ministry of Food, the Ministry of Health, and the Department of Health for Scotland the Medical Research Council have appointed a committee to consider from time to time whether it is necessary on medical grounds to modify or supplement rations in the case of invalids and other persons on special diets. The following have agreed to serve on the committee: Sir Edward Mellanby, F.R.S. (chairman), Prof. L. S. P. Davidson, Lord Dawson, Prof. F. R. Fraser, Prof. H. P. Himsworth, Dr. R. D. Lawrence, Dr. R. A. McCance, and Dr. J. C. Spence. At the first meeting of the committee, which is to be held at once, the question of diabetic diets will be particularly considered. The recommendations will be transmitted by the council to the departments concerned.

Applications for a Lord Nuffield scholarship in orthopædics should be sent to Prof. H. J. Seddon, Wingfield-Morris Orthopædic Hospital, Headington, Oxford, before March 1. The scholarship, which is open to qualified medical men with orthopædic experience, carries a salary of £200 per annum with board and residence for two years followed by £100 for three months' travel.

SPECIAL ARTICLES

BLOOD-PRESSURE AND ITS ESTIMATION

BY CRIGHTON BRAMWELL, M.A. Camb., M.D. Manc., F.R.C.P.
PHYSICIAN TO THE MANCHESTER ROYAL INFIRMARY

(*Concluded from p. 140*)

The Korotkow Sounds

In 1905 Korotkow published his classical observations on the arterial sounds. These gave us a clinical method of estimating the diastolic blood-pressure.

Sounds produced by waves in closed tubes.—How is it that deflation of the armlet causes the changes in the arterial sounds described by Korotkow? To answer that question I must first refer to some experimental observations made on an artificial schema of the circulation. This consisted of the inner tube of a bicycle tyre containing fluid but no air. The distal end of the tube was closed by a wooden bung and the proximal end connected with a pump capable of generating waves in the fluid. The tyre represented a portion of the arterial tree and the pump the heart. Erlanger (1924) found that a wave passing along a rubber tube filled with water produced a sound which varied both in quality and in intensity at different points along the tube. The change in

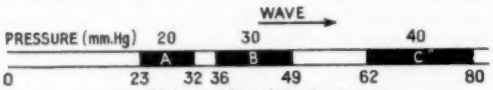


FIG. 5—Positions of disturbed areas under different pressures in a tube.

quality of the sounds, as heard with a stethoscope, enables one to map out three regions in the tube.

(1) In the proximal region, only a dull thud is heard; this becomes louder as one passes farther down the tube.

(2) In the intermediate region, the sound is very loud; here it is no longer dull but sharp like the crack of a whip.

(3) In the distal region, the sound loses its cracking character and becomes progressively fainter as we pass towards the distal end of the tube.

Erlanger pointed out that, in the intermediate region of the tube where the loud crack is heard, the wall of the tube is subject to a severe shock. This he demonstrated by sprinkling fine sand on the upper surface of the tube. With the passage of a wave the sand is violently thrown off from that region in the tube where the shock is most severe and where the loud cracking sound is heard on auscultation, but lies undisturbed in the segments on either side.

Working in Erlanger's laboratory in 1923, I made some further observations on this phenomenon (Bramwell 1937). I found that the position of the disturbed area—i.e., the area in which the sand is thrown off the tube—varied with the pressure of the fluid in the tube. As one raises the pressure, the disturbed area recedes from the proximal towards the distal end of the tube; at high pressures the wave passes down the whole length of the tube without producing sufficient disturbance to throw off the sand. In other words, the higher the initial pressure, the farther has the wave to travel before the conditions arise which lead to the throwing off of sand and the production of sharp cracking sounds.

Fig. 5 shows diagrammatically the results obtained in a series of experiments. When the initial pressure in the tube was 20 mm., the sand was thrown off from the segment marked A near the proximal end of the tube. When the initial pressure was 30 mm., the disturbed area (B) was situated farther down the tube. When the pressure was 40 mm., the disturbed area (C) was situated in the distal part of the tube. Finally, when the initial pressure was 50 mm., the sand remained undisturbed throughout the whole length of the tube. In these experiments all conditions except the initial pressure in the tube were kept constant.

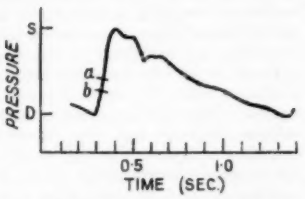
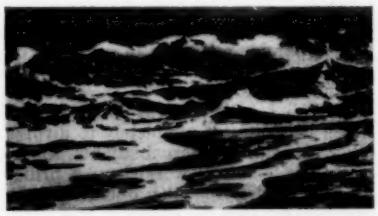


FIG. 6—Carotid sphygmogram: S, systolic pressure; D, diastolic pressure; *a*, *b*, see text.

These observations compel one to conclude that the sharp cracking sounds are produced by sudden oscillations of pressure in that particular region of the tube. To understand why sudden oscillations of pressure develop in the fluid within the tube or within an artery of the human body, one must study the changes which take place in the form of the pulse wave in the course of transmission from heart to periphery.

Change in form of the pulse wave during transmission.—We speak of the pulse wave, but we think of the pulse not as a wave but as an impact. Our physical conception of a wave is based on its relations in space (wave-length), its relations in time (wave frequency) and its pressure. We are accustomed to think of the pulse as we feel it on palpation, or as we see it recorded in the sphygmogram (fig. 6), which is a graphic record of the pressure-time relations of the different elements of the pulse wave at a particular point in the body, the point usually chosen being over the radial artery at the wrist. If one were to record the upward and downward movements of a sea-gull riding the waves, one would obtain a sphygmogram of the waves on the sea. But we never think of the waves on the sea in that way. We think of them as we see them in a painting or in a photograph (fig. 7). There they are represented not as a pressure-time relation at a particular point but as a pressure-space relation at a particular instant of time. In the photograph we have eliminated time; it is instantaneous. In the sphygmogram we have eliminated space.



(after woodcut by Oscar Droge)

FIG. 7—Waves breaking on the sea-shore.

We speak of the highest point of a wave as the crest and the lowest as the trough. The part which stretches from the trough of one wave to the crest of the next we call the wave front. Just as the surface

of a curved mirror may be regarded as consisting of an infinite number of plane facets, so the wave front may be considered as being composed of many small elements. Each of these elements has a certain individuality. The behaviour of a particular element may be studied independently of that of its fellows, although the behaviour of the wave front as a whole depends on the combined behaviour of all the elements of which it is composed.

Most of us, I imagine, still experience a childish delight in watching waves breaking on the beach. There is a peculiar fascination in following a great wave as it mounts higher and higher and then, suddenly, with a roar, dashes itself to pieces. The mechanics of the phenomenon are familiar to you all. As the wave approaches the shelving beach, the progress of its lower surface is retarded by friction on the underlying sand. The crest of the wave, being free to move in the air, travels more quickly than the trough. The wave front becomes steeper, then concave and eventually unstable. It loses its balance and crashes over. The same thing happens to the pulse wave. I showed by experiments on an artificial schema of the circulation similar to that which I have described for studying the production of sound that, as a wave travels down a tube filled with fluid, the wave front becomes steeper in the course of transmission, and eventually parts of it may become unstable (Bramwell 1925).

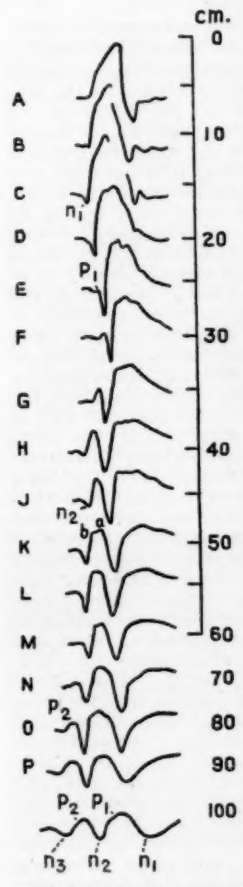


FIG. 8—Series of sphygmograms taken at the same pressure but at different distances from the proximal end of the tube.

Fig. 8 illustrates a series of such experiments. These records were taken at successive points along the tube 5–80 cm. from the proximal end. Close to the proximal end of the tube (fig. 8A) the record obtained is not unlike a clinical sphygmogram. A few centimetres farther down the tube a remarkable thing happens: a small dip (n_1 in C) appears in front of the upstroke. As the wave travels down the tube, this dip deepens. At a point about 25 cm. down the tube a positive wave (p_1 in E) is shot out in front of the negative wave. As it passes down the tube this daughter wave increases in size. At 40 cm. down the tube a dip (n_2) appears in front of the daughter wave; this grows deeper, and at 80 cm. another positive wave (p_2) is shot out in front of the daughter wave.

Before leaving the artificial schema, I must refer to one other point. If we raise the pressure in the tube, the development of the changes which I have described is retarded—i.e., the parent wave has to travel a greater distance before giving birth to a daughter wave. At high pressures these changes are not merely retarded but abolished. The parent wave then travels along the whole length of the tube without ever becoming unstable and throwing off any daughter waves.

The influence of pressure on the form of the pulse wave is shown in fig. 9. All these sphygmograms were recorded at the same point on the tube, but the pressure was different in each record. At the highest pressure the record was of simple form; but, as the pressure was reduced, it became more and more complex. At 30 mm. pressure the daughter wave (p_1) was well developed, and at 15 mm. the grand-daughter wave (p_2) was present. This shows that the distance which the pulse wave has to travel before giving birth to a daughter varies inversely with the pressure. Lowering the pressure produces changes in the sphygmogram at a given point on the tube similar to those observed at successive points along the tube when the pressure is kept constant. Thus, in the development of these pre-anacrotic waves, pressure and distance are interchangeable, and one can plot a curve showing the relation between them. In fig. 10, at distances and pressures the coördinates of which lie above and to the left of the curve the sphygmogram is of simple form, whereas below and to the right of the curve pre-anacrotic waves are present. For example, at a pressure of 30 mm. pre-anacrotic waves appear before the main wave has travelled 20 cm., whereas at a pressure of 50 mm. they do not appear until it has travelled 60 cm., and at 60 mm. pressure they never appear at all, the wave retaining its original form until it is eventually damped out.

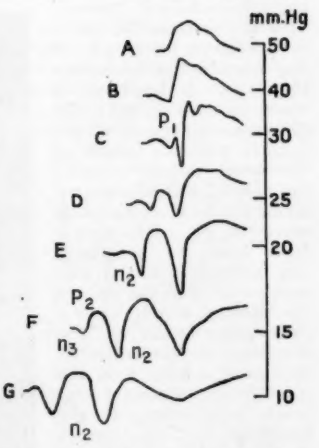


FIG. 9—Series of sphygmograms taken at the same distance from the proximal end of the tube but at different pressures.

For the wave front to become unstable in the course of transmission, the elements which are travelling more quickly must catch up on those which are travelling more slowly. It is the same problem which one has to solve in handicapping runners for a race. There

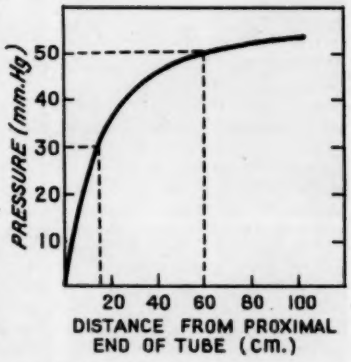


FIG. 10—Relation between pressure and distance determining the appearance of pre-anacrotic waves.

the object which we have in view is to enable the faster man to draw level with his opponent just as he reaches the tape. A handicap is based on two things: the difference in speed of the runners and the length of the race. Let us consider the case of a small element *ab* on the front of the pulse wave (fig. 6). The race is from heart to periphery. The runners are the two points *a* and *b* at the ends of the element in question; *a* runs faster than *b*. The handicap is the distance separating *a* from *b* on the wave front. Unless *a* runs much faster than *b*, the handicap—i.e., the length of the element *ab*—must not be too big, for the race is short, and *a* will fail to catch *b* before he reaches the periphery.

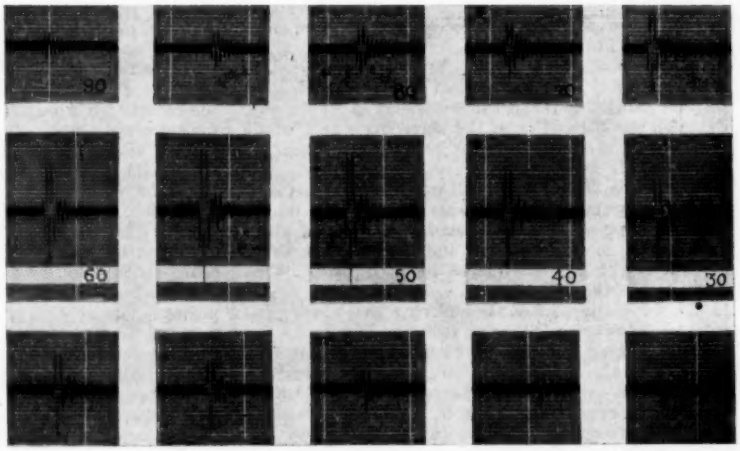


FIG. 12—Continuous phono-arteriogram in free aortic regurgitation during decompression. Compressing pressure signalled every 10 mm. from 90 to 30 mm. Hg.

The relation between the speed, the handicap and the length of the race can be expressed very simply as follows:

If v_1 and v_2 cm. per sec. are the velocities at which *b* and *a* are travelling, the difference in velocity between them is $(v_2 - v_1)$ cm. per sec., and the mean velocity of the whole element *ab* is $\left(\frac{v_2 + v_1}{2}\right)$ cm. per sec. But *a* and *b* are separated by a time interval of *t* sec. Hence the length of the element *ab*—i.e., the handicap is $t\left(\frac{v_2 + v_1}{2}\right)$ cm. and the time required for *a* to catch up *b* is $t\left(\frac{v_2 + v_1}{2}\right) \Big/ (v_2 - v_1)$ sec.—i.e., the handicap divided by the difference in speed of the runners. The distance which the element will travel in this time is $t\left(\frac{v_2 + v_1}{2}\right)^2 \Big/ (v_2 - v_1)$ cm.—i.e., the time *a* takes to catch *b* multiplied by the mean velocity of the element *ab*. If this distance is less than the distance from heart to periphery, the element *ab* becomes vertical and consequently unstable in the course of transmission, and breakers will be formed.

When the wave front becomes unstable, its energy is redistributed. In the case of a wave on the sea-shore this manifests itself by the formation of breakers. In a closed system, such as an artery, which contains fluid but no air, material breakers cannot be formed, for the artery is full of fluid, and there is no air space in which the wave can break. In these circumstances, the pulse wave regains its stability by transferring a part of its energy to new waves, which are shot out in front of it (fig. 8). These new pre-anacrotic waves are strictly analogous in terms of mechanical pressure to the breakers on the sea-shore. They produce a turbulent condition in the fluid in the tube, which manifests itself by rapid oscillations of pressure. Thus the change in form of the pulse wave in the course of transmission explains the phenomena observed in the experiments with the sand-covered bicycle tyre. In the proximal part of the tube, the pulse wave is stable. After the pulse wave has travelled a certain distance down the tube, the wave front becomes unstable and develops what we might call "mechanical breakers." These breakers produce a turbulent condition in the fluid, which sets the wall of the tube into violent vibration and so gives rise to sharp cracking sounds. In the distal part of the tube, the pulse wave has regained its stability. The higher the initial—i.e., diastolic—pressure in the tube, the longer the distance the pulse wave has to travel before becoming unstable.

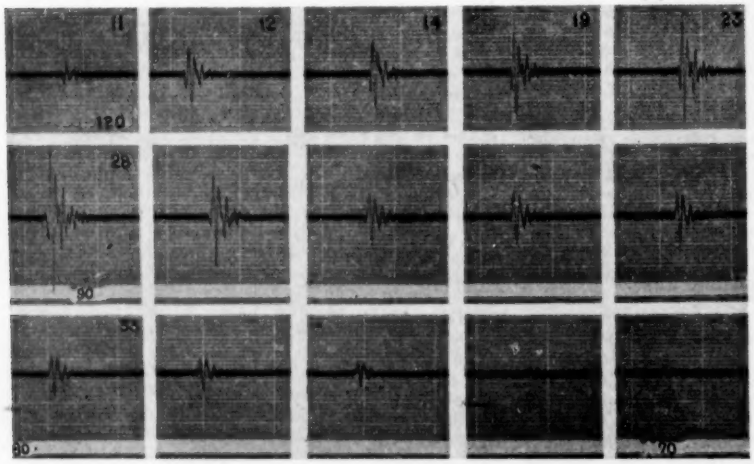


FIG. 11—Selected cycles from a continuous phono-arteriogram in a normal person during decompression. The blood-pressure in this case was 125/85.

Third-phase Korotkow sounds.—Let me now pass on to consider the application of the knowledge we have gained from these experiments with the artificial

schema to the interpretation of the changes in the arterial sounds on which we rely for measuring the diastolic pressure. The connecting link between these two problems is provided by a series of experiments on man (Bramwell and Hickson 1926), the object of which was to ascertain (1) what change in form the pulse wave undergoes in passing through the segment of the brachial artery compressed by the cuff of the sphygmomanometer, and (2) whether this change could be correlated with the change in the sounds heard during deflation of the armlet. The procedure adopted was similar to that used in the estimation of blood-pressure by auscultation, but instead of listening with a stethoscope we took a graphic record of the pulse immediately below the armlet.

By a slight modification of technique (Wiggers and Dean 1917) one can eliminate the slow changes of pressure and record only the rapid vibrations which produce sound. These sound records consist of two series of vibrations. The first is of high frequency and corresponds to the pre-anacrotic waves recorded in the artificial schema. The second consists of a series of large deflexions which increase in amplitude during the early stage of deflation and then become smaller as decompression proceeds. In normal subjects these large deflexions disappear when the compressing pressure is slightly below diastolic (fig. 11), but in patients with free aortic regurgitation (fig. 12) they persist throughout the whole record. The disappearance of the large deflexions coincides with the total disappearance of the Korotkow sounds.

The rapid initial vibrations are present only during the earlier stages of decompression. They attain their greatest amplitude just before, and die away suddenly at the same time as, the sharp third-phase sounds give place to the duller sounds of the fourth phase. The sudden disappearance in the sphygmogram of these pre-anacrotic vibrations, which correspond to the rapid initial vibrations in the sound record, is well shown in fig. 13. In the patient from whom this record was taken the diastolic pressure as estimated by auscultation was 70 mm. Hg.

The fact that the rapid initial deflexions in these records disappear at the same stage of decompression as that at which the sharp third-phase sounds give place to the dull sounds of the fourth phase suggests that their presence is responsible for the sharp cracking quality which characterises the sounds of the third phase. The large vibrations, being of a relatively low frequency, yield a dull low-pitched sound whereas the higher frequency of the pre-anacrotic vibrations gives to them a higher pitched and sharper crack. Thus we have established a complete analogy between the phenomena which we observed in the artificial schema and the clinical observations in man.

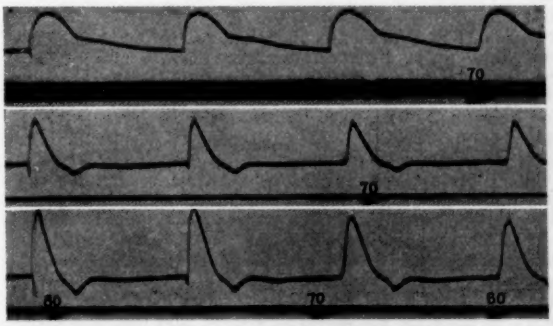


FIG. 13—Sphygmograms taken from the same person, in whom the transition from third-phase to fourth-phase sounds took place at a compressing pressure of 70 mm. Hg. In the lower two records there was a small perforation in the membrane of the recording capsule. This accentuates the amplitude of the deflections. Numerals indicate compressing pressures. Note negative pre-anacrotic wave in first two cycles in each record.

Blood-pressure estimation in aortic valvular disease.—The hypothesis which I have put forward helps to explain the difficulty which one sometimes experiences in estimating the diastolic blood-pressure in aortic valvular disease.

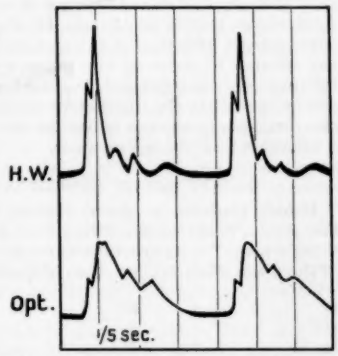


FIG. 14—Synchronous hot-wire and optical sphygmograms, showing anacrotic vibrations.

Bramwell and Hill (1923) showed that, on purely mechanical grounds, under certain conditions, portions of the front of the pulse wave might be expected to become unstable, causing a turbulent condition in the blood-stream with rapid oscillations of pressure in the arteries. When these hypothetical conditions were satisfied in the living body, anacrotic vibrations appeared in the sphygmogram (fig. 14) and could be detected clinically as a thrill. The pulse was then of the "water-hammer" type. The conditions favourable to the development of these phenomena are a low diastolic pressure and a steep pressure gradient along the front of the pulse wave—in fact, the very conditions which are present in patients with free aortic regurgitation. In this condition breakers develop spontaneously and produce sharp sounds resembling the third-phase Korotkow sounds. These sounds may be present throughout the whole period of decompression and so may lead to confusion. It is, however, usually possible by careful auscultation to detect in the course of decompression an alteration in the quality of the sounds. This is the point at which the pre-anacrotic waves disappear and only anacrotic "breakers" remain. It is the true diastolic end-point.

Conversely, in patients with aortic stenosis it is generally impossible to obtain a diastolic reading. The pressure gradient of the anacrotic pulse is so gradual that, even after passing through the compressed segment of the artery, it does not become unstable, and no breakers are formed. The whole range of the Korotkow sounds in such cases may not extend over more than 10–20 mm. Even if we were to assume that the disappearance of the sounds coincided with the diastolic end-point, the pulse pressure would only be 10–20 mm. Such a small pulse pressure would signify a cardiac output insufficient to sustain life. We must therefore conclude that the true diastolic pressure lies somewhere below the point at which the Korotkow sounds die away.

Summary.—The experiments which I have described show that waves in fluid, contained in elastic tubes, may undergo a change in form in the course of transmission. Under certain

clearly defined conditions part of the wave front tends to become unstable. This causes a turbulent motion of the fluid in the tube, comparable to the formation of breakers in a wave on the sea-shore. Similar physical phenomena may develop within the arteries of the living body.

Observations on an artificial schema of the circulation and graphic records of the Korotkow sounds in man show that the change in the sounds which accompanies deflation of the armlet is determined by the change in form of the pulse wave as it passes through the compressed segment of the brachial artery, and that the distinctive cracking character of the third-phase sounds is due to the development of "breakers" in the pulse wave.

EFFECT OF COMPRESSION

It only remains for me to explain how deflation of the armlet leads to the formation of breakers in the pulse wave. The experiments on the change in form of the pulse wave in the course of transmission showed

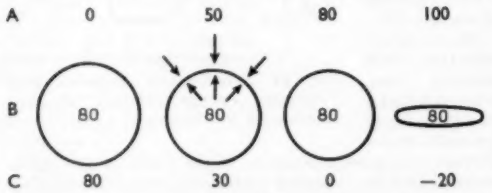


FIG. 15—Diagram showing pressure changes during deflation of armlet: A, compressing pressure; B, diastolic pressure; and C, "effective pressure."

that the higher the initial pressure in the tube, the greater was the distance which the pulse wave had to travel before becoming unstable. In all patients, except those with a very low diastolic pressure, the distance from heart to periphery is insufficient to allow the pulse wave to become unstable; but, if we can reduce the tension of the arterial wall by artificially lowering the diastolic pressure, we will render the conditions favourable for the formation of breakers. This is exactly what happens when we apply external pressure with the cuff.

In the living body, the arterial wall is kept under tension by the pressure of the blood within the artery. When we inflate the armlet we apply counter-pressure from outside, which tends to neutralise the pressure exerted from within. The tension of the arterial wall is then correspondingly reduced, for what we may call the "effective pressure" acting on it is the difference between the external and the internal pressures. When the external compressing pressure is exactly equal to the internal distending pressure, the "effective pressure" is zero and the arterial wall in a state of complete relaxation. When the compressing pressure is higher than the diastolic pressure it causes collapse of the artery during part of the pulse cycle (fig. 15). During deflation of the armlet, as the external pressure falls, the artery first resumes its cylindrical shape and then, as the effective pressure rises, the tension of the arterial wall increases, and conditions become less favourable for the formation of breakers. Thus it is only during the intermediate stage of decompression, when the effective pressure is still very low, that breakers form and the loud, sharp sounds characteristic of the third phase are heard.

I am indebted to the publishers of *Heart* and the *Journal of Physiology* for permission to reproduce figures which have previously appeared in my original papers published by them, and to Dr. W. C. Alvarez and Group-Captain H. A. Treadgold for figs. 1 and 3 respectively.

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BRITISH EMPIRE CANCER CAMPAIGN

A LARGE number of specialties now contribute to progress in cancer research. Clinicians, pathologists and statisticians vie with chemists, biochemists, physicists, biophysicists, radiologists, virus workers, endocrinologists, geneticists and many others in the discovery of significant facts. No longer is it thought that further progress towards a true understanding of cancer must await the discovery of the "mysterious secret of life." Today the immediate objectives of research are much less elusive. The present phase of fruitful activity is attributable mainly to the discovery of filtrable tumours and of carcinogenic chemicals in the field of causation and the discovery of the curative value of X rays and radium on the clinical side. These are the first thoughts aroused by the sixteenth annual report of the British Empire Cancer Campaign. This volume of some 360 pages, edited by Mr. J. P. Lockhart-Mummery, summarises the work done under the auspices of the Grand Council and its many branches and affiliated organisations at home and throughout the Empire—Australia, New Zealand, Canada and South Africa. One commendable feature of the report is that differences of opinion have not been suppressed, so that the reader can see science actually in the making, and can appreciate how different underlying conceptions of the nature of cancer and the mechanism of curative measures determine the different directions in which new knowledge is sought.

SOME SAMPLES OF THE WORK

At St. Mark's Hospital, London, Cuthbert E. Dukes and J. P. Lockhart-Mummery have continued their studies of several generations of ten human families afflicted with familial adenomatosis of the colon and rectum.[1] The disease, in which an apparently simple polyposis of the intestinal mucous membrane regularly becomes carcinomatous, is rare but instructive. There can now be no reasonable doubt that the condition is truly familial and may be transmitted by either parent. What is transmitted? What relationship subsists between the simple state and the malignant? Dukes and Lockhart-Mummery take the view that an inherited instability of epithelial cells of the large bowel renders their nuclei particularly liable to mutation for excessive growth, and that this excessive growth renders the cells particularly liable to a second mutation, a mutation to malignancy. Probably some such underlying view of the nature of cancer has other adherents, for gene mutations and chromosome rearrangements seem to be the main

[1] This study appeared, fully illustrated, in *Lancet*, 1939, **2**, 586.

interest of H. J. Muller and his collaborators at the Institute of Animal Genetics in the University of Edinburgh. They have irradiated the mature spermatozoa of *Drosophila melanogaster* and analysed the subsequent generations, thus throwing light on the tendency of broken chromosomes to join up in certain definite ways.

Workers at the Cancer Hospital, London, have continued the production and study of new chemical carcinogenic compounds. One of those tested was 5 : 9 : 19 - trimethyl - 1 : 2 - benzanthracene, which is thought to have the highest known cancer-producing potency when applied to the skin of mice. What common action substances of such varied chemical structure as the known carcinogenic compounds can have on the cells of the animal body is still difficult to imagine. But such substances do produce tumours, and inquiry is being pushed on at the Cancer Hospital and elsewhere into the mechanism of production. Meanwhile, the substances already brought to light are being used for the production of tumours needed in investigating other problems associated with the cause and cure of cancer. In Glasgow, P. R. Peacock and his colleagues have continued their studies of the absorption and elimination of the carcinogenic agent benzpyrene in various animals. Much is excreted in the bile in somewhat altered form.

Stimulated by the knowledge that animals treated with natural œstrogenic compounds show a material increase in the incidence of mammary tumours, and by the reflection that epithelial proliferation taking place in the female genital tract during various stages of activity resembles the early stages of malignant disease, E. C. Dodds of the Middlesex Hospital and his associates have continued their work on synthetic œstrogenic compounds. Further new compounds have been produced, including one in which a hundred million international units are contained in a single gramme. The biological effects of such compounds have been studied. This work, already well known, has a clinical importance wider than that of cancerology. Other workers too, including those at the Cancer Hospital, have studied the action of œstrogenic compounds. One outstanding consideration which places the œstrogens in a different class from the chemical carcinogens is the fact that œstrin itself occurs naturally in the animal body.

A number of workers—e.g., those at the Royal Victoria Hospital, Newcastle-on-Tyne, and at the Strangeways Research Laboratory, Cambridge, and Mrs. Barbara Holmes at the Sir William Dunn Institute of Biochemistry, Cambridge—have studied intensively the respiratory, glycolytic and other metabolic functions of cancer cells. No absolute differences between malignant and normal cells have been recognised as yet. Underlying these researches is, perhaps, the view that cancer cells are not just normal cells being provoked in some way to an unwonted activity, but are so altered in some essential morphological feature that their metabolic processes are likely to be qualitatively different from those of normal cells.

Some such conception of the fundamental nature of cancer may influence the work of P. A. Gorer at the Lister Institute, London, who reports efforts to produce genetically pure strains of mice so that, in experiments with tumours propagated by the grafting of tumour cells, complications due simply to the "foreign character" of the grafted cells shall be reduced as far as possible. This however is not the sole reason for the use of pure strains in cancer research. Some workers use pure strains because of the regularity with which they respond under given conditions or because of some inbred peculiarity, as in the strains of mice showing high or low incidence of mammary cancer. A. W. Greenwood of the Institute of Animal Genetics, University of Edinburgh, mentions the scheme for the production of carefully bred strains of brown leghorn fowls, so that if peculiarities in reaction are observed by workers to whom the birds have been supplied they may be investigated genetically. One investigation on these lines is now in progress, a certain strain having shown considerable resistance to injections of the infective agent of the Rous fowl tumour No. 1.

In their attempts to determine whether or not tumours produced by chemical agents are also virus tumours workers at the Middlesex Hospital have continued observations on tumours produced in fowls by means of tar. McIntosh and Selbie now report that in their series the total number of these tumours so far found propagable has been raised to nine, and that five of these have proved transmissible by means of cell-free filtrates. Failures to filter they attribute to technical difficulties, and suggest that all induced sarcomata in fowls are filtrable tumours and therefore virus-tumours.

Much of the work is more clinical in bearing. The most effective ways of applying radiant energy are being looked into at many institutions, and an understanding of the mechanism by which cell death is brought about has been studied by animal experiment, by in-vitro experiments with tissue cultures, bacterial suspensions and organic colloids, as well as by examination of human tumours removed at operation after irradiation. Histological studies of tumours have been made with a view to improved classification, diagnosis and prognosis. Elaborate statistical reviews have been made of the geographical distribution of cancers in various parts of the body. The clinical research committee reports progress in their scheme by which hospitals will record case-histories on a uniform plan so that information about diagnosis, treatment, prognosis and the like can be more readily extracted.

The campaign intends to carry on as far as it can during the war, in spite of difficulties created by prior claims which the country has on the services of its workers. For the coming year its grants for research total £35,000, a figure which does not include the sums raised and spent locally by branches and affiliated organisations.

IRELAND

(FROM OUR OWN CORRESPONDENT)

"MARROWBONE LANE"

THERE has been much discussion of a play, written by Dr. Robert Collis, a Dublin physician, which was recently produced at the Gate Theatre, and was so successful that it was put on for a second run. The play is illustrative of Dublin slum life and to many it has recalled the work of Mr. Sean Casey, whose plays on the life of the slums attracted much attention a few years ago. It traces the career of a young woman brought up in a modest but respectable country family, possessed of the dignity and good breeding which is a feature of peasant life in Ireland. She marries into a working-class family in the city slums, with the result, almost inevitable in present conditions, of a descent into poverty and misery. The play, apart from its artistic qualities, is forcibly propagandist, in that it exhibits two of the great faults in the care for health in Dublin—the intolerable condition of many

of the slum dwellings and the shortage of hospital accommodation. For some years past Dr. Collis has been energetic in denouncing present conditions of housing and in putting forward constructive suggestions for their improvement. In a public lecture delivered some weeks ago he summarised his views on these questions. He criticised many points in the housing scheme of the Dublin corporation, and urged that a special commission for housing should be set up, with a competent, energetic manager at its head, and power to carry out its plans. If such a body were appointed, he believed that the citizens of Dublin would willingly find the money. He criticised—and in this he is not alone—the long delays which have taken place in the matter of providing additional hospital accommodation in Dublin.

In a lecture delivered on Jan. 3 Miss L. Bennett, an active worker in the Labour movement, supported Dr. Collis's suggestions, paying special attention to the failure to establish a hospital bureau which would facilitate admission to the hospitals. She quoted incidents of difficulty and delay in obtaining accommodation for patients seriously ill. She blamed both the minister for local government and public health and the hospital authorities for their inactivity. It is known that more than a year ago the scheme for a hospital bureau was agreed upon between the minister and the authorities of the hospitals. Until, however, there would be a substantial increase in the number of beds it did not appear that the bureau could serve much practical purpose. It was agreed, accordingly, that the scheme should not be put into operation until the additional accommodation had been provided. There appears, however, to be no excuse for the delays which have prevented the carrying out of the several plans which have been approved by the minister for development of Dublin hospitals.

SCOTLAND

(FROM OUR OWN CORRESPONDENT)

TUBERCULOSIS IN FIFE

THERE has been a lot of discussion in St. Andrews regarding the control of tuberculosis in Fife. It was stated that the county council had extended the children's wards at Glenlomond Sanatorium at considerable expense, and it was regarded as unfortunate that what seemed an insufficient number of children were being admitted for treatment. The question of the control of tuberculosis among children in private houses has been under careful consideration, particularly in relation to local and evacuated children staying in homes where there were cases of tuberculosis. Periodic careful examination of such children has been urged with a view to ensuring that no infection takes place. The tuberculosis officer has been pressed to send children to Glenlomond in their own interest and in the interest of the public health when any doubt existed. On the other hand, the public-health authorities have submitted that compulsory admission to the sanatorium is not possible and indeed is highly undesirable. They preferred to induce people by persuasion to submit to examination and treatment in the institution when that was necessary.

CHILDREN'S NUTRITION COUNCIL

A meeting was held last week of the new Edinburgh branch of the Children's Nutrition Council which is affiliated with the Children's Minimum Council in London. The council's object involves a study of the present position regarding the nutrition of children in Edinburgh and in the surrounding districts with special relation to the problems created by the war and its disruption of educational services. The council hopes, through its subcommittees, to obtain information regarding the health and nutrition of the children remaining in the evacuation areas and of those in the reception areas, and to conduct a campaign for better education of mothers and housewives in food purchase, food utilisation and cooking. A representative of the Glasgow branch gave valuable information about the work already instituted there. The meeting was attended by representatives of the social-service organisations, educationists, nutritionists, and public-health authorities as well as by general practitioners and other medical men and women. Subcommittees were chosen to carry out the various functions of the council. The hope was expressed that after the necessary information has been obtained the council will try to secure improvement in children's nutrition by making the facilities already available better known, by a campaign of instruction in the use of food and, if need be, by exerting pressure so as to acquire new facilities.

CHEAP MILK FOR MOTHERS AND CHILDREN

The medical officer of health for Dundee has been instructed to submit a scheme for the distribution of milk, free or at reduced prices, for children under school age and for expectant and nursing mothers. In the application of the scheme it will be necessary to fix scales of income for determining the circumstances in which cheap or free milk will be given. With rationing and the increase in food prices there is a more urgent need than ever for such a provision in order to prevent deterioration in the health of the lower income groups. It is likely that the scheme will cost the city over £6500 a year.

GLASGOW ROYAL INFIRMARY

Mr. Charles Glen, now chairman of the board of managers of the Glasgow Royal Infirmary, has pointed out the difficulties under which the institution is working. On the instruction of the Department of Health for Scotland 400 beds had to be reserved for the accommodation of civilian air-raid casualties. The managers made up for this reduction in the number of their beds by the provision of extra beds both in the infirmary and at the Canniesburn Auxiliary Hospital. This reservation of empty beds is not profitable for the infirmary, as has been suggested. So long as the beds remain empty the infirmary receives 29*s*. 6*d*. per week per bed, while if they become needed after an air-raid 45*s*. 6*d*. is received. The average weekly cost per patient in the infirmary, however, is £3. Mr. Glen urges contributors not to withdraw their subscriptions to the infirmary, or it will have great difficulty in making ends meet. During the past year there has been a decline in income and an increase in expenditure to such an extent that, including the previous year's deficit and sums outstanding against a new outpatient department, the infirmary is at present in need of something like £110,000.

BRITISH INSTITUTE OF PHILOSOPHY.—The sixth address of the special series entitled the deeper causes of the war and the issues involved was given by Sir William Beveridge in the assembly hall (entrance in Craven Street, Strand, W.C.2.) of the Royal Empire Society on Thursday last, Jan. 25. He spoke on peace by federation. Further addresses will be given by Sir Richard Gregory, F.R.S. (Feb. 1) and Prof. Ernest Barker, Litt.D., on a date to be announced.

IN ENGLAND NOW

A running commentary from our Peripatetic Correspondents

WHATEVER may be the faults of the London sector scheme—and criticism has not been wanting—at least one beneficial effect has been the bringing into closer contact of the voluntary and municipal hospitals, and their ancillary services. We laboratory folks, who had been the hand-maiden of one, are now serving two masters, and we believe the result has been in the nature of a symbiosis which Sir Arthur Thomson used to define as a "mutually beneficial partnership." Some of the voluntary hospitals professed ignorance of the very existence of a municipal laboratory service, and their mild surprise when they heard we could undertake van Slyke or sulphonamide estimations became frank astonishment when we told them we did Lancefield grouping and even streptococcal typing. One difficulty has been the transport of specimens. Messengers are apparently hard to come by, and much material has been rendered useless from being sent by post often in inadequate containers. Here again we are inclined to crow for we have been accustomed to a highly efficient service of pathological supplies; with transport difficulties the screw-cap container and its cousins have become doubly blest. But the scoring has not all been one-sided. We who were inclined to jog along in a narrow rut have been jostled and shaken up by the more intimate contact with senior and junior staffs of the teaching hospitals. Particularly, we have to be on our toes to meet the eager questionings of the bright young people, and at odd moments you will find us in dark corners hastily and surreptitiously consulting our books of reference. So we are learning, among other things, to respect each other, and we hope that this war-time partnership will bear good fruit.

While our laboratory has been reinforced outside with sandbags and other protective phenomena, inside it has been strengthened, and rather overcrowded, by the addition of a keen and active blood-supply unit. Assisted by relays of senior students our "vampire" has bled close on 600 donors in the first four months of the war, and it is his proud boast that some good use has been made of practically every bottle of blood. Latterly we have been collecting the plasma for the preparation of measles serum. The response of our panel of donors has been good; only about a quarter of the total originally asked to attend have failed to appear and no doubt a large proportion of these were evacuees. More interesting is the fact that a second call is producing a 90 per cent. response, which means that even although the donors know their blood is not being used for the treatment of war-casualties there is no reluctance to attend. Most of them—they are largely women—seem pleased and proud to give their blood, and our team is now kept up to scratch by bleeding 12 to 15 donors every week. The contamination-rate has been nil in different batches tested and the preservation good, but surely more organised research is needed to find out the optimum conditions for blood-storage. Granted that nibbling at a problem is not to be despised, there have been too many incomplete papers published on this subject lately. And is it possible that the war-time use of stored blood has not so caught the public mind as to have become something of a ramp? How many surgeons could give a straight answer to the question "what is primary and what is secondary shock and how are they best combated?" Do we know enough of the relative merits of whole blood, plasma and gum-saline for the treatment of shock? and what of Trueta's claim that secondary shock may be prevented by the early excision of war wounds? Incidentally, Trueta's papers on hospital organisation for, and treatment of, air-raid casualties have been exciting almost as much comment and discussion among us as THE LANCET commissioner's report. Admitting the differences between Barcelona and and Birmingham or London, I personally feel that his views, born of practical experience, should have the widest possible publicity. I think we should pay Dr. Trueta a handsome fee to go and preach his gospel to our administrators and surgeons in every city in Britain.

* * *

Some months ago I decided that—owing to the machinations of the N.A.P.T., or the J.T.C., or perhaps owing to some vital phenomenon—tuberculosis was on a decline and would shortly be played out. So, like the unjust steward, I looked round for some means of escaping the ruin which must inevitably stare the average phthisiologist in the face. I did not have to wait long for an inspiration. I was invited to a wedding; and on the invitation was the request "R.S.V.P." I replied to my applicant in a nice letter giving him my terms. The wedding and the breakfast I would attend free, only charging bare travelling expenses and hire of costume. Speeches would be extra, my fees varying with the nature of the toast, ranging from a real slap-up epithalamium to the Happy Couple (ten guineas), down to a half-a-guinea "Health of the Bride's Mother" (a word or two with a heel-tap vaguely waved in her direction. Perfectly timed and guaranteed not to break up the flow of general conversation). All toasts were guaranteed free from any taint of suggestiveness and would not raise a blush on the cheeks of the most callipygian bridesmaid; and the fee covered an accurate typescript copy for the local newspapers. I received no answer; and I have since learned that the local parson did the whole job, including the splicing, at about a third the price. Mind you, they were welcome to that third-rate artiste. It does not pay in the long run to undercut one's colleagues. I utterly refuse ever to accept less than my full fees; and I believe Schnabel does the same. If we did we should know that we were snatching the bread from the mouth of some struggling young aspirant. If people can't—or won't—afford my fees I am only too ready to recommend one of the younger craftsmen, from whom of course I expect to draw a small commission for the introduction.

I next turned my attention to dinners—especially medical society dinners. During and after such dinners you must provide speeches or music. The more frugal-minded societies provide music. They can get quite a good soprano for two or three guineas plus her dinner which she eats behind a screen or in the next room (because of the stories); but if she is old and ugly your diners moodily finger their wine glasses and murmur "Hell," and if she is young and charming they are continually popping behind the screen to see if she's got everything she wants. In either case it's all rather distracting and a speech-maker is well worth the little extra. My terms are much the same as for weddings and I should like to stress my devotion to that life-long principle learned from the lips of Leo Sheffield: "I accept food from any hand, however lowly." I have never swerved

from this resolution, and please God I never shall. My only charges are travelling expenses, hire of costume and oratory.

It usually falls to my lot to answer for "The Guests," and therein lies a most profitable sideline. Many a guest will pay quite handsomely to have the Right Thing said about him. Not only that, there is an almost unlimited clientele of men who are not guests but who feel they deserve an honorable mention. It pays them, you see. When I begin an anecdote with, "—Osler rang me up the other evening—" everybody asks each other, "Who *is* this man Osler?" and his name is bandied about from mouth to mouth and is stored in their memories for future reference. It's like "Guinness is good for you" on the posters, only better. It wasn't long before I discovered another source of income: that to be derived from guests and others who preferred not to have the Wrong Thing said about them. Gynæcologists are gilt-edged in this respect. When I casually mention, "I tried to get hold of 'X' (insert any name you don't like), but he was away in the country operating on h'r'm—an acute appendix," you will understand that behind the scenes a remittance has not arrived. For this goodwill I expect only a nominal subscription payable on each January 1 or within fourteen days. Alternatively, the candidate could compound for life with a fifteen years' subscription in a lump deposit.

You may be wondering why I am divulging this beautiful scheme to all your readers. The reason is that I shan't be needing it myself. Nor will any other phthisiologist. It is true that quite advanced cases of pulmonary tuberculosis are being passed into the army, so long as they present no stethoscopic signs, and that a number will perish in military hospitals; but against them, thousands of consumptives have been evacuated from their sanatoria to tenements hermetically sealed during the hours of blackout, where they are sowing the infection quietly and efficiently.

When harvest-time comes we shall not be unprepared.*

(* Acknowledgment: I pinched that last phrase from one of our statesmen.)

* * *

"So shines a good deed in a naughty world." The world is undoubtedly naughty, but Sir John Anderson's deed is not good enough to shine much. For a few weeks I was forced to conclude that there was no new street lighting in the London district with which I am familiar, until a ride on the top of a bus brought me face to face with it. The lights do not noticeably light up the street, even to a person who is specially looking for them. To be worth while during the blackout a system of lighting must surely illuminate the kerb-stone—a fruitful source of accidents—the other people and objects, stationary or locomotive, in the streets, and, if possible, the street names. But perhaps I am not yet fully dark-adapted (is that the right phrase?).

PUBLIC HEALTH

Responsibility for Tuberculous Patients

THE unusual mobility of the population during the last months has raised problems among local authorities in reception areas as to who is responsible for the treatment of evacuees who have been found to be suffering from tuberculosis. In a letter addressed to the local authorities and joint tuberculosis boards on Jan. 19, the Minister of Health states that he considers the responsibility for the treatment of these people rests primarily with the authority of the reception area. He does not wish this ruling, however, to override the reciprocal arrangements which many authorities had arranged between themselves before the outbreak of war, where the authority of the area in which the patient was ordinarily resident agreed to accept the responsibility. In collecting payments from patients the Minister considers that authorities should follow their usual practice and treat their evacuees as they would treat their own residents. But no contributions should be exacted for children unaccompanied by an adult relative who have been evacuated under the Government scheme. The Government will be prepared to take into account in the general arrangements for reimbursing local authorities the cost of treating these children in hospitals under the E.H.S. It will also be open to the authorities after taking into account payments made by the patients themselves or by other authorities under reciprocal agreements to enter any additional costs incurred in treating Government evacuees as an evacuation charge.

On Jan. 19 at a meeting with a deputation from the Socialist Medical Association of Great Britain, the Minister stated that 125 tuberculosis institutions had, since Nov. 1, been released entirely from their obligations to the Emergency Medical Service so that they could devote the whole of their accommodation to their normal functions. More than two-thirds of the 28,000 beds provided for the treatment of tuberculosis in England and Wales were still available for that purpose, and at the moment about 3000 of these beds were vacant.

This Year's Vintage of 'Flu

A correspondent, writing of the current epidemic of influenza, says that the disease is highly infectious. Some patients are feverish and giddy when first seen but others begin by complaining of very sore throats and at first have no raised temperature. The sore throat may on the other hand not be evident until fever has been raging for several days. It progresses as a rule to tracheitis, which is obstinate and trying. A small minority of patients develop signs of acute bronchitis, and a few of the worst of these have had some bronchopneumonia. His worst case, with a temperature between 104° and 105° F. for several days had an astonishing (and alarming) crisis after stiff doses of sulphanilamide and M. & B. 693. Others responded conveniently to sulphanilamide. No doubt, he writes, after the first few days secondary invaders are at work; and it has been noteworthy that several young men, after going along quietly with an evening temperature not much over 102° F. for several days have suddenly gone up to 103·5° F. or so, just when recovery was expected. Caution is therefore advisable. Laryngitis is common and may be afebrile. Coryza is less common, while vomiting is unusual. A few patients have shown a follicular tonsillitis with fairly characteristic course. Headache and other aches and pains are less obvious than is usual with influenza. After recovery cough is often troublesome, but depression seldom.

School Meals in London

Circular 1490 of the Board of Education mentioned the difficulty of arranging for the supply of free meals or milk to children who are not attending the emergency schools and who, in fact, may not be under any instruction at all. During the last few weeks the London school medical officer has been trying to get in touch with all children of school age in order to bring them back into the scope of the school medical service. The nutrition reports of the school doctors on children seen at the new schools and also at clinics are encouraging. Of 885 children examined in the first thirteen emergency schools to open, only 51 (or about 6 per cent.) were placed in the "slightly sub-normal" category, none lower. School teachers retain the discretionary power granted to them before the war of authorising school dinners in emergency to any of their pupils whom they suspect to be suffering from lack of food.

Points from Annual Reports

The joint board for tuberculosis of *Staffordshire, Wolverhampton and Dudley* reports that the death-rates from pulmonary tuberculosis were 0·65 for Wolverhampton and 0·67 for Dudley. In the various urban and rural districts the rates varied greatly, from 0·03 in Lichfield rural (population 32,210) to 1·03 in Kidsgrove urban (population 14,600). Dr. Carruthers says that "pulmonary tuberculosis is a disease endemic to towns and urban districts, for in many rural districts the rate is so low as to be almost negligible." In other tuberculous manifestations there is little difference between urban and rural areas. Of 3435 patients seen for the first time at the dispensaries 2363 were not tuberculous. Of the 2169 sent directly by medical practitioners 1360 were not tuberculous. A high proportion of diagnoses not confirmed in tuberculosis and venereal work, and also in notifications of disease, is not a bad but a good point in working. Of the 737 cases of confirmed pulmonary tuberculosis 301 were in the T.B. minus class. It is of supreme importance that as many cases as possible should be recognised at this stage, and this can only be secured by examining a large number of suspects, the majority of which will be eventually discarded as non-tuberculous.

Dr. Lonie, of the *Isle of Ely*, pleads for pasteurisation, and later says he is "not at all happy about non-pulmonary tuberculosis." In 1938 non-pulmonary tuberculosis gave 42 notifications and 12 deaths against 47 notifications and 11 deaths from the pulmonary disease. Non-pulmonary tuberculosis has been constantly high in Isle of Ely for many years and shows no tendency to fall.

Dr. J. A. Charles, of *Newcastle-upon-Tyne*, calls attention to the prevalence of death from heart disease in middle age, which was responsible for a third of the total deaths between 45 and 65 years of age. "Until we are able to slacken the speed at which modern life and industry are carried on," he says, "there will be no substantial reduction in the number of deaths from these causes." Dr. Charles suggests the organisation of a cardiovascular clinic, comparable to the tuberculosis dispensary, for periodical review of patients, assessment of their physical capacity, and redirection of their activities. This used to be one of the main functions of the family doctor. In recent years we have heard much of the increase of fatal cardiovascular disease in comparatively young adults from the United States, but so far it has attracted little attention in this country. The rise in cardiovascular diseases to the first place in the causes of death is universal but this is largely because the deaths of old people, which were formerly certified as due to senility, are now ascribed to this cause. During the years 1927-38 the mortality table of England and Wales ascribes 61·1 per 1000 of all deaths to "circulatory diseases" and 45·9 to senility. Diseases of the heart itself are held responsible for about a quarter of all deaths, but without analysis of the returns it is not possible to say which, if any, of the forms of heart disease are rising or falling in incidence. From American records it seems quite certain that non-valvular disease in early middle life is rising briskly in mortality, whilst from our records it seems probable that rheumatic valvular disease is declining.

INFECTIOUS DISEASE

IN ENGLAND AND WALES DURING THE WEEK ENDED DEC. 30, 1939

Notifications.—The following cases of infectious disease were notified during the week: Smallpox, 0; scarlet fever, 1042; whooping-cough, 602; diphtheria, 805; enteric fever, 12; measles, 2175; pneumonia (primary or influenzal), 649; puerperal pyrexia, 131; cerebrospinal fever, 45; poliomyelitis, 4; polio-encephalitis, 10; encephalitis lethargica, 4; dysentery, 37; ophthalmia neonatorum, 50. No case of cholera, plague or typhus fever was notified during the week.

Deaths.—In 126 great towns, including London, there were no deaths from smallpox or enteric fever, 7 (0) from measles, 3 (0) from scarlet fever, 3 (1) from whooping-cough, 24 (0) from diphtheria, 22 (3) from diarrhœa and enteritis under 2 years, and 46 (8) from influenza. The figures in parentheses are those for London itself.

Bristol reported 2 deaths from measles and Birmingham 2 deaths from whooping-cough. Fatal cases of diphtheria were scattered over 20 great towns, Liverpool reporting 4 deaths and Bristol 2.

The Lancet 100 Years Ago

Jan. 25, 1840, *p.* 673.

From a letter to the Editor signed "B," Uckfield, Sussex.

PAGE. Shall I fetch th' 'pothecary ?
WILDRAKE. Nay, an' it must be so,
Bring me a physician at once.

BEAUMONT AND FLETCHER.

"A physician at once," Sir! Momentous resolution! The apron-girt apothecary is dismissed with a thought, for him of the solemn phiz, full periwig, lace ruffles, and never-to-be-forgotten gold-headed cane. In those days there was a mighty gulf between the two functionaries of my quotation; but Time, the great destroyer of conventional distinctions, has done much to lessen it, and the great army of "generals" is pressing forward to occupy a better position. . . . The physician is defiling his dainty hands in the till of the druggist, and sharing with him the spoils of the Materia Medica, or invading the province of the practitioner, and competing with him in his charges. . . . The privileged universities have lost their usefulness, and the graduate the charter of his power. But the physician still has his use, were it only in sharing the responsibilities which so frequently press upon the practitioner. Whilst heart-burnings are so frequent amongst their own order, every general practitioner will fully understand this use. But when the physician loses his identity, and puts on the hybrid character, he become at once a serious evil.

LETTERS TO THE EDITOR

RATIONS FOR INVALIDS

SIR,—I was sorry to see you supporting in your issue of Jan. 20 (p. 132) the suggestion that, pending the report of the committee now considering the matter, all invalids should be entitled to their accustomed quantities of food on presentation of a doctor's certificate.

I believe such a suggestion to be wholly mischievous. The result of adopting it would be that every selfish hypochondriac would pester his doctor for a certificate, and the doctor, small blame to him, not liking to refuse, the Ministry would be snowed under with applications. This is what I found happen in the last war when, as medical adviser to the Ministry of Food, I had the responsibility of dealing with hundreds of such applications daily. I do not myself believe that at the present moment there is the least reason for extra rations for anybody, but should the committee decide otherwise, they will be well advised to define as precisely as possible those diseases for which concessions are to be made, otherwise nothing but trouble and dissatisfaction will result. In 1917 the inclusion of that vague condition gastritis, for instance, as one of the diseases justifying special rations, gave an opportunity of which the functional dyspeptics, and their name is legion, were quick to avail themselves.

I am, Sir, yours faithfully,

Devonshire Place, W.1. ROBERT HUTCHISON.

VITAMIN E AND NERVOUS DISEASES

SIR,—Dr. Franklin Bicknell, in his article on vitamin E in your issue of Jan. 6, says that if the suggested connexion between vitamin E and tabes dorsalis proves correct then the reason why some syphilities develop tabes and others do not will be explained and the arrest of tabes will be made possible. The pathogenesis of tabes and amyotrophic lateral sclerosis seems, however, to be more complex. Nonne, who has perhaps had the most experience with neuro-syphilis in Germany, once said: "A man before getting syphilis should first of all provide himself with sound parents." Curtius[1] was the first to investigate systematically the constitutional factors in the pathogenesis of tabes. He comes to the conclusion that somatic constitution (Körperbauform) has no significance in the incidence of tabes, but that pyknic people incline to mild and stationary forms, leptosomatic and asthenic people to grave and progressive forms of tabes. Since mild forms and "formes frustes" are often not diagnosed, tabes appears to occur more frequently in the second group. Curtius further points out the marked psychic and neuropathic stigmata in the families of tabetic and the psychopathic features shown by tabetics themselves before the disease develops. He also considers the influence of environment on the progress of tabes.

The hereditary tendency has also been demonstrated in amyotrophic lateral sclerosis (a.l.s.). My clinical teacher, Salus of Prague, for example, showed that in a case of syphilitic a.l.s. spastic spinal paralysis and a.l.s. could be found in other non-syphilitic members of the family, so that the hereditary tendency to a.l.s. was the pathoplastic factor in this case.

In spite of these facts, however, I do not doubt the good effect of vitamin E in the reported cases. I can also see that vitamin E (perhaps together with some other vitamin) may have had something to do with the origin of such diseases of the nervous system in man, for lack of vitamin may have been the primary cause of such "mutations." Considering the relation of vitamins to the endocrine glands and thus to "asthenic metabolism" (Jahn, Scheid) the possibility of influencing the general constitution with vitamins seems no longer to be a utopian dream. On the other hand, in the deficiency diseases, the influence of constitutional factors in determining individual susceptibility to vitamin deficiency will have to be more widely considered.

I am, Sir, yours faithfully,

London, N.4. H. POLLAK.

1. Arbeit und Gesundheit. 33: Tabes dorsalis, Leipzig. 1938.

THE MIND OF HITLER

SIR,—During the past months the medical and lay public have been offered a very great deal of what purports to be psychological exegesis of Herr Hitler, and the unwelcome eruption of this individual upon the European scene appears to have been a godsend to those who enjoy characterising people they have never seen in the idioms of medical psychology. One is not surprised to find journalists and literary folk indulging in this fashionable and easy hobby, but at a time when medical psychology is struggling hard for acceptance as a scientific discipline it is odd to find the director of an institute of experimental psychology willing to give the widest publicity to a very detailed psychological assessment under conditions that preclude anything more than speculation and exclude all possibility of scientific judgment.

I do not presume to say that Herr Hitler does not suffer from the diverse psychological disorders that Dr. Brown thinks he can recognise in him, for I cannot lay claim to that extensive mental hospital training that can alone justify the making or the disputing of a psychiatric diagnosis. In this matter, presumably, Dr. Brown may have the advantage of me. But what I, and many others who are not psychiatrists, ask ourselves is whether anyone in this country can possibly know all that Dr. Brown tells us in such detail and with such confidence. We wonder whether in fact all this so-called psychological analysis is any more than the emotive use of psychological terminology, giving unconscious expression to that detestation of Herr Hitler and his works which psychologists, like the rest of us, must feel. The possibility is one that the psychologists themselves will be the first to recognise.

May it not be that where our simpler and more outspoken ancestors in similar circumstances were content to call Napoleon the "Corsican ogre," knowing that in so doing they were relieving their feelings but not explaining Napoleon, our learned contemporaries who are doing the same thing when they dub Hitler a paranoiac with messianic leanings, are deluding themselves into the belief that they are analysing him? They have called him so many things that this seems likely. Indeed, upon a careful computation, I find that he has been said to suffer from every psychological disaster save only Korsakow's psychosis and dementia paralytica. Surely with such a "complication of diseases" Hitler could never have done what he has done.

If indeed we could defeat Germany by advancing repeatedly upon Hitler at the head of a few hundred words, there might be some purpose in all this glib "analysis," but even the fearsome terminology of

medical psychology breaks no bones, and I feel that the time has come to call a truce to it until, as may well happen some day, the psychiatrists have the opportunity of a first-hand study of Herr Hitler and can provide us with more facts and less fantasy.

In my coarse unpsychiatric fashion I am prepared to say that Herr Hitler is a nasty piece of work with an overweening opinion of himself, and I am not persuaded that by saying he has almost every known psychological disorder the psychologists have penetrated any more deeply into the matter. They are simply using bigger and uglier words about him. He deserves this verbal drum fire, but does it mean anything?

I am, Sir, yours faithfully,

London, W.1. F. M. R. WALSHE.

SIR,—Perhaps one of the most striking features of our "war of nerves" has been the silence of the Führer. Before the war, Europe trembled at its would-be master's voice once every few weeks. Now even the German people have had a chance to forget the familiar accents. If your psychiatric contributor is right, a simple solution suggests itself. The Führer doesn't know what to say, so has taken refuge in hysterical aphonia! One can picture the scene in Chancellery. Each day the eminent professors of psychiatry visit their august patient. As they go out to discuss the case with Goering their eyes twinkle a little. Breathes there a man who is prepared to administer an electric shock or a kick in the pants to divinity? Meanwhile, the plans for the Greatest Reich lie locked behind the dissociated hysteric's sealed lips. No-one dare risk action when the return of the power of speech to the Führer may at any moment prove it wrong. I suspect that the "war of nerves" has already claimed its most august victim.

I am, Sir, yours faithfully,

HYSTEROPHOBE.

BLOOD-CULTURE MEDIA

SIR,—Prompted by the paper in your issue of Jan. 13 (p. 65) on blood-cultures and selection of media, I wish to make a plea for the reduction in the number of culture media generally used, and even advised as a routine by the authors. In recent years, in these laboratories, we have almost entirely relied on a medium (or its modification) as described by O'Meara (*Brit. J. exp. Path.* 1934, **15**, 295), except in possible anaerobe infections when Robertson's meat-medium is utilised in addition. Experience over the past five years has shown O'Meara's medium to be equally efficient for all the organisms commonly encountered in septicæmic states. Infections with *Strept. viridans*—i.e., subacute bacterial endocarditis—have given positive results in six out of seven recent cases, mostly with no more than eighteen hours' incubation; the seventh case showed no organisms during post-mortem examination of the vegetations, and must have therefore been in a bacteria-free phase as described by Libman.

The question of the ratio of the inoculum to medium is also important; the above results are obtained with inocula of from a few drops to 0·5 c.cm. added to 15 c.cm. of broth at 37° C. In using 2 c.cm. of blood to 8 or even 10 c.cm. of medium Dr. Fairbrother and his co-workers seem to make inadequate allowance for the known bactericidal power of the blood in these cases, which will delay growth if not prohibit it altogether. Sufficient allowance is made for this factor in the procedure outlined above; furthermore, with such an inoculum, individual colonies are easily observed in primary culture so that plate-pouring and subculture, two possibilities for contamination, are superfluous.

Finally, it is observed that the procedure of inoculating two, or three at most, broth tubes can be easily mastered by the individual at the bedside and so obviate the necessity for and possible complications of even trained assistance.

I am, Sir, yours faithfully,

MAGNUS HAINES,

Assistant Pathologist, The John Burford Carlill Pathological Laboratories.

Westminster Hospital.

THE FELLOWSHIP OF MEDICINE

SIR,—Prof. Grey Turner's interesting account of his visit to South America in your issue of Jan. 13 concludes with the words: "Since the activities of the medical institutions in England are not available in a government or other central department, a foreigner is often at a loss to know to whom he is to apply for information, and *the sooner we establish a central bureau of medical information the sooner will this defect be rectified*" (my italics). The Fellowship of Medicine, which has been established in London for over twenty years, has had many thousands of foreign and colonial postgraduates through its hands. Its journal and its numerous lists of postgraduate courses all over London are circulated widely throughout the Empire. Its office is open daily, and work there is unceasing. In short, it has been and is just such a bureau of information as Prof. Grey Turner demands.

In spite of enormous difficulties, inevitable at the present time, the Fellowship is still continuing its work, and since the outbreak of war has been able successfully to arrange a fair number of postgraduate courses for which there has been a real demand. In view of its unceasing activities and of the fact that so many outstanding teachers have at different times been officers of the Fellowship, Prof. Grey Turner's apparent ignorance of its very existence is somewhat shattering to some of us who have devoted no little time and energy during the last twenty years to its welfare.

I am, Sir, yours faithfully,

MAURICE DAVIDSON,

Acting Hon. Secretary, Fellowship of Medicine.

1, Wimpole Street, W.

PEMPHIGUS NEONATORUM

SIR,—I was interested in the comments of Dr. F. Glyn-Hughes in THE LANCET of Jan. 13. There has been a long and acrimonious discussion as to whether the causal organism of pemphigus neonatorum is a streptococcus or a staphylococcus, and I do not think that the matter can be considered as finally settled. It does not seem to have been sufficiently emphasised that the organism is identical with the organism of impetigo, and is as specific in impetigo as the gonococcus in gonorrhœa. It should be named the impetigo-coccus, so that its individuality would be recognised as of far greater importance than its subordinate position in the family of streptococcus or staphylococcus.

The impetigo-coccus produces regularly in children of school age a disease of the skin so distinct that it is recognisable at sight. The organism, as found regularly in direct smears, is a gram-positive diplococcus, often intracellular. In newborn children, and in some older children in whom the two layers of skin are not so closely knit, pemphigus is the result of infection. The reactions of the impetigo-coccus to

chemotherapy and to culture media should still be considered apart from any streptococcal or staphylococcal prejudices, since the fact that is known most certainly is that no other streptococcus or staphylococcus will ever produce a lesion remotely resembling the impetigo of Tilbury Fox.

I am, Sir, yours faithfully,

Beaminster, Dorset. R. E. HOPE SIMPSON.

THE CASE FOR A REHABILITATION BOARD

SIR,—Whether this is an appropriate time to raise a national issue like the establishment of a rehabilitation board is a moot point, but your leading article in last week's *Lancet* gives a prominence to the subject which merits further attention.

There are few who doubt the wisdom of sound care and aftercare, especially for the tuberculous population, and, as pointed out by the principal medical officer to the Ministry of Health (Annual Report, 1932), "The maintenance of a tuberculous person and of his wife and family in a village settlement is the most valuable piece of aftercare work that has yet been devised." Few tuberculosis physicians have criticised the general methods adopted in village settlements; the principle has been almost universally conceded.

Were the problem so simple as indicated in your leading article there would be neither rhyme nor reason for one moment's delay, but Lord Willingdon in his note in the *Times* of Jan. 13 refers to the necessity for "flexibility in administration." No-one realises more than I do the need for flexibility in the administration of village settlements, but there is grave doubt as to whether "the lack of precision," essential for certain rehabilitation programmes to which Lord Willingdon refers, could be reconciled with any of the existing methods of government or local government administration, and I have grave doubts whether any of the sources at present dispensing unemployed and health benefits would be prepared to grant that very flexibility and lack of precision which is advocated.

It is, however, that section of Lord Willingdon's communication which suggests that amongst the functions of the board should be the power to become contractor-general to public authorities which is at once the most important and delicate part of the entire scheme.

And yet, if rehabilitation is to be successful on a national scale, some such arrangement is essential. I would go so far as to forecast that unless such powers were granted to a national board the scheme would be a failure. The success of Papworth and Preston Hall and of the other medico-industrial organisations which have achievements to their credit in the field of rehabilitation has been due largely to the constant flow of orders into their factories. But whether the Government and local authorities would agree to the wide powers suggested for the rehabilitation board raises controversial political questions of the first magnitude—questions on which many sound advocates of rehabilitation would take diametrically opposite views.

If settlements for the disabled were relieved of the necessity of employing a large and expensive sales organisation, if they knew that they had an absolute monopoly for goods required for public bodies, then many of the real problems besetting village settlements from time to time would vanish.

In a note on this subject from me, which you published in March 1933, I enumerated certain difficulties confronting local authorities in the inauguration of village settlements for the tuberculous. Amongst these I mentioned that local authorities are no doubt prepared, subject to approval by the Ministry of Health, to undertake the necessary *capital* expenditure, but that it was the fear of possibly having to meet large and recurrent losses in trading that was one of the most serious obstacles in their path. We know from experience that losses on trading may result, even when the factories are fully employed, but they are nothing to the losses which may follow when a department is forced, through the lack of sufficient orders, to work at less than half pressure.

Another objection which local authorities have raised (and a national board might well be faced with the same criticism from the national standpoint) is that if the scheme is to be a success it can only be so by successful trading in competition with ratepayers, the majority of whom are resident within the administrative area of the authority; if, on the other hand, a loss has to be met, the subsidy to cover this loss would, under existing conditions, come in part at least from the rates. If these difficulties have been considered by local authorities, how far are they likely to be weighed in judgment before the adoption of a widespread national scheme which would be "contractor-general" to public authorities, and, in some cases, subsidised by national funds?

I am well aware that the alternative is the depressing one of continuing to crawl along the rehabilitation path by voluntary effort, attempting to enlist the sometimes unwilling support of local authorities, and for each scheme to enlarge from time to time from the capital which has been won by cinema entertainments, premières, poppy days and so on. Those who know best the inner histories of Papworth, Preston Hall, Barrowmore Hall, Wrenbury Hall and other schemes for the rehabilitation of the tuberculous, are well aware of the apathy which has characterised a large number of local authorities in supporting the work both from the medical and industrial aspects, and it is an established fact that many medical organisations which could help village settlements by placing orders not infrequently go elsewhere for their requirements. If there is to be any charity in this matter, I should have thought it might have started at home.

A national rehabilitation board, as has been suggested, appointed "contractor-general" and capitalised from the sources which are at present subsidising physical disability by pittances which offer no hope of economic recovery, will solve a problem which is older than national health insurance and local government. Voluntary effort has shown the way. Will the administrators of public funds agree to the fundamental changes which the scheme implies?

I am, Sir, yours faithfully,

Preston Hall, nr. Maidstone, Kent. J. B. MCDOUGALL.

UNITED HOSPITALS MAGAZINE

SIR,—The editors of the magazines of several of the London teaching hospitals are trying to push a new venture. Many of us have felt that for long the students of these hospitals have been brought up in too great an isolation from one another. Such work as we have done in the E.M.S., when we were scattered in the sector hospitals of London, has reminded us strongly of the need for coördination of thought and ideas among the apprentices of our profession. And with the hope of breaking down the barriers which isolate one teaching hospital from another, we have launched an interhospital magazine.

On its editorial board sit representatives from such

(*Continued on opposite page*)

PARLIAMENTARY INTELLIGENCE

ON THE FLOOR OF THE HOUSE

By MEDICUS, M.P.

THE House reassembled on Tuesday, Jan. 16, to resume normal business, to hear a statement on the progress of the war from the Prime Minister and to hear Mr. Hore-Belisha's apologia "as a retiring Minister." There had been a great deal of front-page "sensation" about Mr. Belisha's resignation and even the offer of an expensive advertisement, asking for Mr. Belisha's retention in the Ministry, to a large number of newspapers, so that many people hoped for a parliamentary sensation. But Mr. Belisha's and Mr. Chamberlain's statements were dignified and reserved. Mr. Attlee and Sir Archibald Sinclair saw no reason for using the occasion as a basis for any major criticism, and very soon all was quiet on the parliamentary front. If Parliament had been sitting when the Prime Minister decided to change his War Minister it would have become apparent, even more quickly than it did, that the change was due to personal and temperamental reasons, or, to use the Prime Minister's own words, "difficulties . . . arising out of the very great qualities of my right hon. friend."

On Wednesday the Chancellor of the Exchequer almost casually announced that the 4½ per cent. conversion loan 1940–44, amounting to about 350 million pounds, would be repaid on July 1 next, and holders would be offered conversion into a new loan at 2 per cent. This operation is likely to save between 8 and 9 million a year in interest. On the same day the Minister of Economic Warfare made his first statement, telling us of the two main branches of his Ministry's activities: (1) contraband control, and (2) buying up in neutral markets things needed by Germany, as by ourselves, so as to deprive her of essentials for her war effort. Thursday was occupied in passing the National Loans Bill through all its stages, beginning at 3.45 P.M. and finishing at 4.12 P.M., leaving the way open to the second reading of the India and Burma Bill, which was completed by 5.48 and passing on to a discussion of service dependants' allowances—chiefly those of the parents of unmarried soldiers. On this the new War Minister, Mr. Oliver Stanley, made his first speech. Mr. Stanley is a very distinguished and very hard-working minister and he promised full inquiry.

All of the activities just chronicled are of the greatest importance. The Chancellor has fixed war-loan interest at a low figure which will save us many millions while the war continues and after the war. Our economic warfare is proving a very potent weapon and public grievances are receiving adequate public discussion. The self-discipline of Parliament is increasing its efficiency. But this only refers to what is "on the record" of *Hansard*; more and more as the war develops private committees of the House are doing work "off the record" which is of quite as much value. This applies with greater force than usual to a meeting arranged by the Medical Parliamentary Committee for Thursday evening, to which the different parties officially invited their members when sending round their official "whip" dealing with the week's business. Mr. Elliot addressed a good and representative meeting in committee-room 5 upstairs on medical services for the civilian population in war-time, with the chairman of the Medical Parliamentary Committee, Sir Francis Fremantle, presiding.

The Minister reviewed the reasons for setting up the Emergency Medical Service—first, anticipation of great air-raid casualties, and second, the need for clearing civilian sick from urban hospitals in places liable to this attack. As a result of these arrangements 195,000 beds were available within four days of the outbreak of war. A staff of about 2000 doctors was taken on, but later, 60 per cent. were released on a part-time basis with an undertaking to give full-time service in an emergency. The result of the changes has been to provide hospital services for civilians by which they are either admitted directly, as in provincial areas, or, as in London, admitted partly through London hospitals and partly direct into sector hospitals. The accommodation for civilians is now good and Mr. Elliot assured us that no civilian patient requiring it is now refused admission. Some hospitals, including their sector accommodation, are larger than pre-war. Bart's, for example, is now bigger than it was a year ago. There is now some movement back from the periphery to the centre, but not too much must come back. The adjustment is being considered. Extra hutted hospital accommodation of 14,000 beds is now erected and fully equipped and over 9000 more beds are available in an emergency. At the present time, despite the extensive use of hospitals for civilians, there are some 150,000 beds vacant for casualties. The organisation of nurses has also gone ahead. There are now some 15,000 nurses, 7000 assistant nurses and 75,000 nursing auxiliaries on the register of the Central Emergency Committee of the Nursing Profession and available for service when required. In order to help in nursing organisation the Minister has appointed a regional matron in each of the civil defence regions into which the country is divided. An important adjustment adapting war and civilian organisation to each other is the release of schools when possible to the education authorities and facilitating the use of first-aid posts, with their decontamination spray baths, for the use of the school health service in evacuation and neutral areas.

The Minister turned from this subject to a survey of civil medical services and evacuation and gave the total figures of those officially evacuated on the outbreak of war as follows. Total 1,220,496 people, divided into 688,000 unaccompanied children, 70,000 teachers and helpers, 445,000 mothers and other adults and young children, 11,300 expectant mothers, 5300

(*Continued from previous page*)

hospitals as are willing to coöperate. At present, nine out of the thirteen London teaching hospitals are represented. There is, of course, no intention of interfering with the existing individual hospital magazines. We hope to obtain articles from all students willing to write, and from the newly qualified, while the paper will be sold in the medical schools. It is extraordinary that so large a body as is formed by clinical students has so far had no unified press. The first number of "United Hospitals" is out, and we await the response with interest.

We are, Sir, yours faithfully,

B. DELISLE BURNS,
R. R. WILSON.

*** We welcome this journal as the harbinger of a new solidarity in the London medical schools. It was the last war that brought London graduates together; perhaps this one will do the same for undergraduates—ED. L.

blind adults and 870 adult cripples. This large movement of population was carried out without any of those disastrous consequences by way of serious epidemics or otherwise, which might not unnaturally be feared under these circumstances. The maternity services on the whole worked well; by October there were 137 improvised maternity homes, chiefly in large houses taken over and adapted, and in the first six weeks of war about 3400 confinements had taken place in the homes. At the end of the year the number of homes was 85, but altogether they had dealt with 6200 confinements. The weekly returns of puerperal fever and puerperal pyrexia have been approximately on the same level as those for 1938. Leading items in the treatment of school-children have been the establishment of domiciliary treatment, and sick bays for minor illnesses or those convalescent from more serious illness, and the provision of additional accommodation for infectious disease, often in large houses taken over for the purpose. As a precaution measles and whooping-cough have been made notifiable. Up to date the incidence of infectious illness has been less than in the corresponding period of last year, and the Minister asked whether that was related to the thinning out of the child population in congested areas.

* * *

It is too early yet to sum up the civilian health situation for 1939. Vital statistics are not yet available and when they are will be complicated by the large movement of officially evacuated population, to which must be added the also large shifting of businesses and privately evacuated people. Some hardships have been inflicted. A large number of tuberculous cases receiving residential treatment were cleared from institutions. On July 1, 1939, the number of institutionalised cases was 26,456 but on Nov. 30 it had fallen to 19,150 and this represents an improvement on the still greater reduction which took place on the outbreak of war. There are some special problems to clear up for it is not yet possible to give a complete picture of the state of child welfare services or of the inpatient maternity accommodation in urban areas. But what is known is that illness in general has been less than for many years. This is not only the experience of general medical practitioners and consultants but is shown by a decline in the number of N.H.I prescriptions, the fall in September being 9·3 per cent. and in October 5·3 per cent. as compared with the corresponding months last year. The national insurance medical service has adjusted itself to war conditions. In most areas the bulk of insurance doctors have voluntarily agreed to participate in some scheme for the protection of practices and this has facilitated the working of the service.

In conclusion Mr. Elliot said that the civil medical services are at present being called on to operate under specially difficult conditions because of the uncertainty of the precise character and extent of the calls which the development of the war may make upon them. But on the other hand, they are better equipped both in personnel and material than was the case 25 years ago and have to deal with a population with a considerably higher standard of life. The outlook should therefore be one of confidence. Questions to the Minister dealt with some decrease of maternity beds in towns with which the Ministry was dealing, and elicited the fact that a very small percentage of expectant mothers are still going to reception areas for their confinements. Finally, Mr. Elliot said that the medical organisation of the civil defence regions was ready, and, as he described it, "ticking over," so as to be able to take over in an emergency.

The Minister did not deal with the nutritional problems of war, but he has himself appointed a committee to advise on problems of rationing for sick persons, including of course diabetics. And the Central Emergency Committee has also appointed a "War Nutrition Committee" which will consider special problems of war nutrition. To use Mr. Elliot's phrase, and without losing sight of many problems and details that still await final solution, the medical organisation of the nation is "ticking over" very regularly and is ready when needed to come into action.

FROM THE PRESS GALLERY

Dependants' Allowances

IN the House of Commons on Jan. 18 Mr. LAWSON said that when, in October, the Government promised an inquiry into the allowances for soldiers' dependants the Labour Party never dreamed that the conditions under which the dependants of unmarried soldiers received allowances would be altogether overlooked. Today masses of people who were parents of soldiers were feeling aggrieved. By far the greater number of serving soldiers were single men, and under the present regulations only a very few of their parents could get any allowance at all. There was need for overhauling the conditions under which allowances were granted. The old means test had crept into the service man's conditions. The allowance practically dictated the giving of a pension. It would be found that in cases where there had been no allowance there would be no pension.

Mr. SLOAN said that the alarming increase in the cost of living since the outbreak of war was not represented so far as the workers were concerned by the index figure of the Board of Trade, but it was having a serious effect on their meagre incomes. Was it the opinion of the Government that the dependants of our soldiers should go hungry so that income-tax should not again be increased?

Mr. OLIVER STANLEY, Secretary of State for War, said that the morale of the various services would largely depend on whether they felt that those they had left behind were being fairly treated. He intended to go into the whole system of allowances. To put forward a system of dependants' allowances and ring it round so tightly with conditions as to make it inoperative would be intolerable. On the other hand, the Government had never pretended that this or any other possible system would ensure that war would make no difference to the position of anyone concerned. Everyone desired to see a system which would work fairly and as expeditiously as possible, and which would relieve these cases of grievance, need and hardship. The assumption that the dependants of a man who was killed were not entitled to receive a pension unless at the time of the man's death they were receiving a dependants' allowance was not correct.

QUESTION TIME

Hospital Coördination

Mr. WOODBURN asked the Minister of Health whether, in view of the impossibility of voluntary hospitals being able to maintain and extend their services in such a way as to meet the urgent needs of the sick and injured, he was, in view of the national emergency, prepared to organise the whole hospital system on a sound economic basis, coordinated and planned to meet the needs of the population. —Mr. ELLIOT replied: As I stated in the course of the debate on the address on Dec. 5 last, the problems of the coördination of the hospital system as a whole, including the proper relation of the voluntary hospitals to the municipal hospitals, are matters requiring our closest attention. A very large measure of coöperation from all sections for the purposes of the emergency medical service is necessary and has in fact by the goodwill of all concerned been secured, but I do not think it is practicable in present circumstances to embark upon far-reaching changes such as those suggested.

Treatment of Service Dependants

Mr. KENNEDY asked the Minister if he had considered the question of the desirability of securing the right of the dependants of men on service to medical treatment from their own doctor as an alternative to the charity of the doctor or treatment secured by application to the public assistance authority.—Mr. ELLIOT replied: I have received representations on this subject, which are being considered in consultation with the War Office.

Domiciliary Treatment

Mr. GROVES asked the Minister whether, having regard to the dissatisfaction which was known to exist amongst general medical practitioners with regard to the distribution of work, some more satisfactory and impartial method than the procedure adopted for medical treatment of unaccompanied children in reception areas would be decided upon in order to obtain the cordial coöperation of general practitioners under the proposed domiciliary medical service for civilians who sustained war injuries in this country and thus ensure successful service.—Mr. ELLIOT replied: As the hon. member will see from a memorandum shortly to be issued, the arrangements for the domiciliary treatment of uninsured civilians who sustain war injuries necessarily differ in certain respects from those made for unaccompanied children. I am not, however, aware of any dissatisfaction with regard to the distribution of work in relation to the medical treatment of these children in reception areas: on the contrary, I have received the most cordial coöperation of the medical profession.

National Camps

Replying to questions by Mr. PARKER and Mr. MANDER, Mr. ELLIOT said that thirty-one camps had been begun by the National Camps Corporation. Of these, twelve were now completed, five would be completed by the end of this month, and the remaining fourteen, with the exception of one on which work was only recently started, were well on the way to completion. Two camps were already occupied. One of these was occupied by physically defective children from London, who with their teachers numbered approximately 190; and the other was in the temporary occupation of the Bank of England, who were under notice to quit by Jan. 29. A third camp would be occupied in a fortnight's time, and negotiations for filling other camps were now proceeding.

Green Line Coaches

Mr. ROBERT MORRISON asked the Minister whether he was aware that eight Green Line coaches had been standing in the public highway opposite Tottenham town hall, night and day continuously since Sept. 1, 1939; and whether it was intended that these coaches would remain in the public highway for the duration of the war.—Mr. ELLIOT replied: I am aware that certain Green Line coaches serving as emergency ambulances are stationed outside Tottenham town hall, by arrangement between the London Passenger Transport Board and the police. I am informed that it is not practicable to station these coaches at a garage in view of the fact that they must be kept with tanks constantly full, and the present arrangements may need to continue so long as the vehicles are required as war-time ambulances. The number of Green Line coaches taken over as ambulances at the outbreak of war has already been reduced by about 150.

Overcrowding and Slum Clearance

Mr. JENKINS asked the Minister whether he proposed to grant permission to local authorities to resume the building of dwelling-houses in areas where there was a shortage of houses, overcrowding or slum dwellings.—Mr. ELLIOT replied: I am prepared to give sympathetic consideration to proposals for the provision of a certain number of houses urgently required, in particular houses for the accommodation of workers in the factory and on the land. Having regard to the shortage of certain building materials and to the financial position, however, I am not in a position to modify the general advice which I gave to local authorities in circular 1866.

Treatment of Cancer in Wales

Mr. JENKINS asked the Minister whether he was now in a position to make a statement as to the steps taken in South Wales and Monmouthshire for the establishment of a radiotherapeutic institute for the treatment of cancer.—Mr. ELLIOT replied: I understand that steps are being taken to convene a meeting of representatives of the counties and county boroughs concerned to consider further the question of establishing a radiotherapeutic institute for the treatment of cancer in this area.

Pulmonary Disease in Coalminers

Mr. JAMES GRIFFITHS asked the Postmaster General, as representing the Lord President of the Council, what progress had been made with the investigation by the Medical Research Council into the problem of silicosis among anthracite and other miners; and when he expected a report of the findings of the investigation.—Captain WATERHOUSE replied: The investigation into industrial pulmonary disease among workers in the South Wales coalfield has suffered some slight delay as a result of the war, but it is nevertheless hoped that sufficient evidence will be available for an interim report in the early summer.

The Changing Population

Sir FRANCIS FREMANTLE asked the Minister of Health whether he was now providing for the annual health returns from county and local authorities to distinguish between those of evacuated persons in reception and neutral areas and those of the true population of such areas.—Mr. ELLIOT replied: No, Sir. I should be unwilling in present circumstances to impose additional requirements upon local authorities in making these returns, and the forms used in previous years have in fact been modified with a view to saving work to local authorities. Moreover, other movements of population than that of persons officially evacuated under the Government evacuation scheme have taken, and are taking, place; and I think it would be difficult, if not impossible, to determine what should be regarded as the true population of an area.

Sir F. FREMANTLE: Will this not vitiate the whole series of extremely important statistics so far as the Ministry is concerned? Mr. ELLIOT: It is true that it will make them more difficult to interpret.

Special Diet for Invalids

Mrs. ADAMSON asked the Chancellor of the Duchy of Lancaster whether he had now reached a decision with regard to supplementary rations for diabetics and others who, under medical orders, must have a special diet, which usually required larger rations of butter and bacon than was allowed under the existing scheme.

Mr. HARVEY asked whether arrangements could be made for an additional butter ration to be provided for expectant mothers and nursing mothers.

Rear-Admiral BEAMISH asked whether he was aware that medical officers of health and organisations concerned with the service of tuberculosis prevention and cure were anxious to ensure that tuberculous patients should be enabled to obtain adequate quantities of butter; and would he state the position and prospects of such requirements.—Mr. W. S. MORRISON replied: As announced on Dec. 26, reference to medical opinion has not established that supplementary allowances of rationed foods for invalids are necessary at the present time, but I am arranging to obtain further authoritative advice in regard to particular illnesses. At the request of the Minister of Health and the Secretary of State for Scotland, and of myself, the Medical Research Council have appointed an expert committee to advise from time to time whether it is necessary on medical grounds to modify or supplement rations in the case of invalids and other persons on special diets. As regards nursing mothers, the local food offices issue a child's ration book so soon as a birth is notified and this may be used by the mother in supplement of her own book.

White Flour

Mr. DE LA BERE asked the Minister of Health whether, since the Army contracts purchasing department prohibited the use of chemically treated white flour for the troops he would consider affording the same protection to the general public.—Miss HORSBRUGH replied: The Minister is not satisfied on the evidence available to him that a general prohibition would be justified.

OBITUARY

KATHARINE ROSEBERY DRINKWATER

O.B.E., M.B., B.SC. LOND., D.P.H.

Mrs. Drinkwater, who died on Dec. 29 at Holly Cottage, near Wrexham, at the age of 67, was the eldest daughter of Dr. Henry Mason Jay, of Chippenham, Wilts, and was educated at Bath High School and Bedford College, London, taking a science degree in 1896. After working as science mistress at Grove Park, Wrexham, she decided to take up medicine and studied at the London School of Medicine for Women, qualifying L.S.A. in 1903 and M.B., B.S. Lond. three years later. Returning to Wrexham, she married Dr. Harry Drinkwater, F.R.S.E. and joined him in practice, after his death assisting Dr. S. E. Jones and Dr. D. L. Pow. In 1908 she was appointed assistant school medical officer to Dr. J. L. Williams and later became medical officer to the antenatal and child welfare clinics in the borough. During the last war she did pioneer work in training nurses for V.A.D. work and was then in charge of the women's part of the military hospital at Imtarfa Hospital, Malta and was awarded the O.B.E. Twenty years ago she was made a J.P. for Denbighshire and a member of the advisory committee. In many other directions her wisdom and experience found expression. She was a visitor to the North Wales mental hospital, a recognised teacher of the Central Midwives Board, and last year president of the local branch of the Medical Women's Federation. In her leisure time she bred Highland terriers and was frequently a judge at important dog shows.

THOMAS BUXTON FLINT

M.R.C.S., J.P.

Dr. Thomas Flint, who died in Buxton on Jan. 9 at the age of 70, came of a medical family. His grandfather, Dr. Peter Flint, was secretary of the Buxton Bath charity in the early part of last century, while both his uncle and his father were on the staff of the Devonshire Hospital. Dr. Thomas Flint qualified from Owens College in 1895 and held house appointments in Manchester before returning to practise in Buxton. From 1906 to 1935 he was medical officer of health and saw the incorporation of the town and the establishment of the first child-welfare centre. His appointment to the Devonshire Royal Hospital dated from 1902 and he remained until his death a member of its committee of management. For 13 years he sat on the county bench.

W. S. writes: By the death of "Tom" Flint, Buxton loses the last member of several generations of doctors who have practised medicine in the town for over 120 years. He was a family physician of a type which is now becoming rare; his patients relied on his judgment in many things and he was their friend as well as doctor. In return they gave him their unswerving loyalty. A well-read man, he kept himself up to date in medical and general literature, and though conservative to a degree he did not neglect the modern methods of treatment. His work came first, always, but he had other interests. He was one of the earliest motorists in Derbyshire and owned a car in 1898; this was a wonderful machine in which he managed to get to most places he wanted without many breakdowns. In his younger days he was an excellent shot and a good trout fisherman; for years he had a small grouse moor near Buxton where he spent many happy hours. In his passing we shall miss a good friend, an unassuming and straightforward man who gave his best to everything he undertook.

Dr. Flint was twice married. He is survived by his widow and a daughter of the first marriage.

WILLIAM WALLIS ORD

O.B.E., M.D. OXFD, M.R.C.P.

Dr. Ord, consulting physician to Salisbury Infirmary, died on Jan. 17 at the age of 79. He was the son of Dr. W. M. Ord of Upper Brook Street and was educated at Dulwich College, University College, Oxford, and St. Thomas's Hospital. In his student days he was a distinguished rugby footballer, playing for Surrey and captaining the St. Thomas's and United Hospital sides. He qualified in 1887 and after holding house-appointments at St. Thomas's and the Victoria Hospital for Children and studying in Vienna, was, for a time, physician to the West End Hospital for Nervous Diseases. In 1896 he went into practice in Salisbury and in 1898 was appointed physician to the infirmary, a post he held until 1923. He was awarded the O.B.E. in 1920 for his war services as medical officer to the Wilton House and Longford Castle auxiliary hospitals for officers. Dr. Ord married a daughter of Colonel John S. Billings, M.D. of the United States Army, and he leaves a widow and two daughters.

HERBERT CHARLES

Sir Comyns Berkeley writes: For over forty years Herbert Charles administered the anæsthetic to most of my patients. During this somewhat unusual experience never once did I know him lose his temper; never once did I know him to get "rattled"; never once do I remember his having expressed any anxiety as to the condition of the patient which might have embarrassed the operator. Always in complete command of the anæsthesia, no patient could have been safer than in his hands, and he was a tower of strength during dangerous operations or emergencies. "How is she, Charles?"—"All right," or "All right, but don't be too long," nothing more and nothing less. Charles never indulged in irrelevant chatter during an operation but remained quiet and confident, giving his whole attention to the patient. In other words, he was the perfect anæsthetist.

One of the older anæsthetists who commenced practice before the advent of more modern methods, Charles's command of the administration of chloroform, ether and A.C.E. was such, and his after-results, qua anæsthesia, were so good, that these more modern methods did not appeal to him so much as to his younger colleagues. It must not be supposed from this that Charles was not an expert in such modern methods, if the surgeon preferred them, but he was an enthusiast for the old-established and well-tried methods of administering anæsthetics in contradistinction to those more mechanical. It might have been that had I commenced practice later I should have appreciated the more these modern methods, but Charles's administration was so perfect that I was entirely satisfied with his services, as were also my patients, many of whom during these long years from time to time inquired after his well-being, and referred with great appreciation to his kindness and the confidence with which he inspired them during their trying experience. Had it been my lot to have an operation I should unhesitatingly have asked Charles to administer the anæsthetic.

Apart from the practice of his profession, Charles was a keen mason, a good shot and a charming companion. His knowledge of natural history, antique furniture, pewter and many other things, made him always an interesting companion to anyone who had the privilege of his acquaintance. A most loyal friend and colleague, I cannot remember his ever saying an unkind word about any of our mutual acquaintances, and he thoroughly deserved his great popularity with all classes. His death has deprived me of one of my greatest friends whose services I shall always remember with increasing gratitude.

"The kindest man,
The best conditioned and unwearied spirit in doing courtesies."

SIR SAMUEL BRIGHOUSE

THERE can be few medical men in South-west Lancashire who did not at some time come into personal or professional contact with their late 90-year old coroner, Sir Samuel Brighouse. Conversely his acquaintance with doctors and their vocabulary in his witness-box was extensive and intimate. It was never my privilege, writes Dr. R. J. A. Berry, to give any sort of evidence before him, though as his only medical son-in-law I have occasionally had the less onerous task of sitting beside him on some of his inquests. Here was excellent opportunity for noting his skill in translating medical technicalities into the more homely speech of his jurors, and no essential point was lost in the translation. I do not think Brighouse ever treated medical witnesses with anything but courtesy and a dignity worthy of his own profession and theirs. He wanted and got the truth for his jurors; hence he was apt to be intolerant of the witness, technical or medical, who befogged the issue in a smoke-screen of professional terms. His most celebrated case was one which at the time stirred Lancashire, and indeed all England, to its depths—the Maybrick enquiry. In the midst of all the turmoil, created by press and public alike, Brighouse preserved a judicial calm and dignity. Of the justice of the verdict he had no doubt. In his 78th year it was my privilege to attend at his own home the annual Christmas family dinner—no Spartan feast either. The next morning, long before his guests had quite found out what had struck them, Brighouse was up and off and had conducted no fewer than five inquests with much incidental travelling in between. Like all legal coroners he was convinced that the profession of medicine was not the proper training for a coroner. Be that as it may he upheld the dignity of his office and ruled his court with justice, ability, and a kindness which many a recipient of his coroner's poor-box will remember.

MEDICAL NEWS

Royal College of Physicians

On Feb. 7 Dr. F. G. Chandler will deliver the Mitchell lecture to the college, speaking on the diagnosis and treatment of pulmonary tuberculosis. On March 7 Dr. J. C. Spence will give the Bradshaw lecture; his subject will be the nature of disease in infancy. Both these lectures were postponed from last year. On Feb. 13 and 15 Dr. R. E. Smith will deliver the Milroy lectures on acute infectious diseases at school. Dr. W. D. W. Brooks has chosen as the subject of his Goulstonian lectures, which he gives on Feb. 22, 27, and 29, the pathology and treatment of pulmonary tuberculosis. Prof. E. P. Cathcart, F.R.S., will discuss the mystery of alimentation in the Oliver-Sharpey lectures on March 12 and 14. Dr. George Graham will give the Croonian lectures on May 16 and 21; he will speak on recent advances in diabetes mellitus. All these lectures will be given at the college, Pall Mall East, S.W.1 at 2.30 P.M. and members of the medical profession will be admitted on presentation of a card.

Postponement of Military Service for Students

In an appeal brought as a test case by the Ministry of Labour and National Service the umpire has laid down that a student will be granted postponement of military service if he has been studying for at least a year and will be taking a "critical examination" within nine months of the date of his registration. Sir Ernest Wingate-Saul, K.C., the umpire, defined a critical examination as one which marks a critical point or determines a definite stage in the student's career. The term does not apply, he said, to all necessary examinations leading up to a final examination.

Civil Nursing Reserve in War-time

About 4000 auxiliary nurses, of whom just over 1000 would be whole-time and the others part-time, will be required to staff the Emergency Hospital scheme and the first-aid and district-nursing services in Warwickshire. Dr. Fraser Brockington, deputy county medical officer of health, in a report to the local emergency committee for the nursing profession says that, allowing for wastage, the present effective enrolment stands at 2033. Of these 577 have already completed the training approved by the Ministry of Health.

University of Wales

At recent examination for the D.P.H. Idwal Pugh was successful in part II.

Bedford County Hospital

A new ward and casualty department, which have cost £16,000 to build, have been opened at this hospital. The ward is a memorial to Walter Gifford Nash who served the hospital for close on forty years as honorary surgeon. He died in 1935.

Tribute to Keswick Doctor

On Jan. 10 two tablets were unveiled at Keswick in memory of Dr. R. K. B. Crawfurd, who died last year. Dr. A. E. Shepheard-Walwyn unveiled a memorial in Station Street close to Dr. Crawfurd's old home, and Prof. and Mrs. Darnley Naylor unveiled a memorial in the Mary Hewetson cottage hospital. A portrait of Dr. Crawfurd has also been hung in the council chamber of the town.

Course on Mental Deficiency

The Central Association for Mental Welfare in coöperation with the University Extension and Tutorial Classes Council will if sufficient applications are received hold a course on mental deficiency and allied conditions at the London School of Hygiene, Keppel Street, W.C.1 from April 8 to 20. The course will be based on the requirements for the D.P.M. and is intended for medical practitioners who are concerned with the care of subnormal or abnormal persons. It will include instruction and practice in mental testing. The lecturers will include Dr. A. F. Tredgold, Dr. Henry Herd and Miss Lucy Fildes, Ph.D. Those who wish to attend are asked to apply as soon as possible and in any case not later than Feb. 28. Further information may be had from Miss Evelyn Fox, c/o University Extension Department at the School of Hygiene.

Miss Margaret Huxley

The nursing profession of Ireland lost its most noteworthy figure three weeks ago by the death of Miss Margaret Huxley at an advanced age. She was, indeed, the pioneer of modern nursing in Ireland. Although attempts had been made in Dublin from the 'sixties onward to establish training schools for nurses, it was not

until Miss Huxley was appointed lady superintendent of Sir Patrick Dun's Hospital in 1884 that any real success was attained. Miss Huxley, who was a niece of Professor Huxley, had trained at St. Bartholomew's Hospital a few years earlier and had come to Ireland in 1883 as matron of the National Eye and Ear Hospital. From 1884 to 1902 she was lady superintendent of Sir Patrick Dun's, and her pupil nurses established a high reputation for her training, and many of them became heads of the schools of other hospitals. It was not only in the hospital itself that she promoted the education of nurses: she was the leader in establishing the Metropolitan School of Nursing at which courses of lectures were given to nurses in training at any of the Dublin hospitals. This institution continues its useful work to the present. She also established the first nursing-home or private hospital in Dublin which, from the time of her leaving Sir Patrick Dun's, she herself conducted until advancing years necessitated her retirement from active work. She was greatly interested in the organisation and advancement of the nursing profession, and contended for its recognition as a skilled profession. It was largely due to her advocacy that state registration of nurses was established in Ireland and a state examination arranged. It is not too much to say that for the last half century Miss Huxley was the leader in every progressive movement in Irish nursing, and was held in respect and affection by both nurses and medical men. Expression of this respect was given by the University of Dublin, which in 1928 conferred upon her the degree of M.A. *honoris causa*. In an address at her funeral the Rev. Savell Hicks described her as "a brilliant organiser, a grimly determined fighter of abuses, the most generous of friends, the kindliest and most dignified of teachers; she belonged to that best type which the Victorian age produced in its golden prime."

Old-age Pensions

In the House of Commons on Jan. 23 Sir John Simon outlined the Government's new scheme for old-age pensions. Of the 3,000,000 old-age pensioners about 275,000 now get additional relief from their local public-assistance authorities amounting to some £5,250,000 a year. The Government proposes to transfer this burden to a central organisation analogous to the Unemployment Assistance Board. The needs of an old-age pensioner will be assessed on the same basis as is now applied to unemployment assistance—namely, the total income of the household of which he or she is a member. The extra money paid to those who need it will be in the nature of a supplementary pension, paid through the Post Office, so that the recipients need not feel they are receiving charity. The wives of contributory pensioners who are 65 or over will receive a pension at 60, instead of the present 65, and women insured in their own right will also qualify for a pension at 60.

The Chancellor explained that a general increase in the pension, besides being too costly, would have meant that some were still not getting enough while others were getting more than they needed. The cost of lowering the pension age for women—about £8,000,000 a year—will be met by an extra contribution of 2*d*. a week for men and 3*d*. a week for women, 1*d*. in each case being paid by the employer.

Medical Diary

Week beginning Jan. 29

ROYAL SOCIETY OF MEDICINE, 1, Wimpole Street, W.1.

THURSDAY
History of Medicine, 2.30 P.M., Dr. Douglas Guthrie: The Healing Art in Ancient Greece.

FRIDAY
Otology, 10.30 A.M., Mr. A. W. G. Ewing, Ph.D.,: Audiometric Tests and the Capacity for Hearing Speech. Mr. W. M. Mollison and Mr. T. E. Cawthorne will also speak.
Mr. A. J. Wright: Results of treatment of Menière's disease.
Laryngology, 1.30 P.M. cases.
2.30 P.M.: Clinical Meeting.
Anæsthetics, 2.30 P.M., Dr. Ernest Landau, Dr. J. U. Human and Dr. F. B. Mallinson: Premedication.

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, W.C.2.

MONDAY.—3 P.M., Mr. A. H. McIndoe: Inlay Grafting with special reference to obliterative Conditions of the Vagina (Hunterian lecture).

TUESDAY.—3 P.M., Mr. R. Davies-Colley: Tumours of the Bone.

WEDNESDAY.—3 P.M., Surgeon Rear-Admiral C. P. G. Wakeley: The Treatment of certain types of External Hernia (Hunterian lecture).

THURSDAY.—3 P.M., Mr. D. H. Patey: Demonstration of the Pathological Effects of Trauma.

FRIDAY.—3 P.M., Mr. D. Ll. Griffiths: Volkmann's Ischæmic Contracture. (Hunterian lecture).

MEDICAL SOCIETY OF LONDON, 11 Chandos Street, W.1.

MONDAY
4.30 P.M., Group-Captain G. Struan Marshall: Some Physiological Problems of Human Flight.

TAVISTOCK CLINIC, Westfield College, Kidderpore Avenue, N.W.3.

MONDAY.—3 P.M., Dr. J. A. Hadfield: Direct Reductive Analysis.

BRITISH POSTGRADUATE MEDICAL SCHOOL, Ducane Road, W.12.

TUESDAY
2.30 P.M., Lord Horder: Ward Clinic.

WEDNESDAY
11.30 A.M., Clinico-pathological conference (medical).
2 P.M., Prof. Dible: Ulceration and Malignant Diseases of the Intestine.
3 P.M., Clinico-pathological conference (surgical).

THURSDAY
2 P.M., Dr. Duncan White: radiological conference.

FRIDAY
2 P.M., Clinico-pathological conference (gynæcological).
Daily 10 A.M.–4 P.M., Medical clinics, surgical clinics and operations obstetrical and gynæcological clinics and operations. 1.30–2 P.M., post-mortem demonstration.

FELLOWSHIP OF MEDICINE AND POSTGRADUATE MEDICAL ASSOCIATION, 1, Wimpole Street, W.1.

Brompton Hospital, S.W.3.

MON. AND THURS.
4.30 P.M., M.R.C.P. course in chest diseases.

Births, Marriages and Deaths

BIRTHS

ANDERSON.—On Jan. 19, in London, Dr. Dorothy Anderson, the wife of Dr. R. G. Anderson—a son and daughter.
BOWDEN.—On Jan. 14, at Berhampore, Bengal, the wife of Captain J. W. Bowden, I.M.S.—a daughter.
NEWBERY.—On Jan. 15, at High Wycombe, the wife of Surgeon Commander D. A. Newbery, R.N.—a daughter.
WARD.—On Jan. 8, at Lelant, Cornwall, the wife of Surgeon Lieutenant F. G. Ward, R.N.V.R.—a son.
WYNNE.—On Jan. 19, at Banbury, the wife of Dr. H. Roger Wynne—a daughter,

MARRIAGES

CAMPBELL—SCOTT.—On Jan. 13, at Harvard University Chapel, Charles Macfie Campbell, M.D., to Margaret Janet Scott of Cairo.
COPLANS—MCEWEN.—On Jan. 17, at Gosport, Surgeon Lieutenant Robert Michael Coplans, L.M.S.S.A., R.N., of Hendon, to Anne Helena McEwen, Q.A.R.N.N.S.
CORKER—RONAYNE.—On Jan. 20, at Croydon, Robert Morrison Corker, L.M.S.S.A., of Upper Warlingham, Surrey, to Margaret Mary Alacoque Ronayne, of Ballyhaunis, co. Mayo.
FORRESTER—WILLIAMS.—On Jan. 17, at Llanelly, Wallace Forrester, M.B., of Barnton, Midlothian, to Cicely Helen Williams, of Llanelly.
HAGENBACH—MELVILLE.—On Dec. 16, at Dumfries, Charles Edward Hagenbach, M.B., to Barbara Melville.
THOMAS—PARKER-GRAY.—On Jan. 18, at Berhampur, Orissa, India, Stanley Ferguson Thomas, M.B., to Joyce Parker-Gray, of Northampton.

DEATHS

ALLEN.—On Jan. 18, at West Hampstead, Charles William Allen, M.R.C.S.
ANDERSON.—On Jan. 16, at Paignton, Lieut.-Colonel Samuel Anderson, M.B. Glasg., I.M.S. (retd.).
ARMSTRONG.—On Jan. 18, at Lee, London, Henry George Armstrong, M.R.C.S., late medical officer at Wellington College, aged 88.
BATTISCOMBE.—On Jan. 19, Christopher George Battiscombe, M.B. Aberd., of Tunbridge Wells, aged 82.
BRAINE-HARTNELL.—On Jan. 17, James Christopher Reginald Braine-Hartnell, F.R.C.S.E., late of Cheltenham.
CORBETT.—On Jan. 19, at Devonport, Surgeon Lieut.-Commander Louis John Corbett, L.M.S.S.A., R.N.
GANS.—On Jan. 16, at Boscombe, Friedrich Gans, M.D. Prague, M.R.C.S.
GRAHAM.—On Jan. 21, at Wimbledon, Allan Gordon Graham, M.R.C.S.
ORD.—On Jan. 17, at Salisbury, William Wallis Ord, O.B.E., D.M. Oxfd.
RINGDAHL.—On Jan. 19, on active service in Hong Kong, Surgeon Lieutenant Knut Erik Olof Ringdahl, M.R.C.S., R.N.V.R.
SHAKESPEARE.—On Jan. 20, at Barnet, John Hope Shakespeare, M.B. Camb., D.P.H., aged 33.
SIBBALD.—On Jan. 20, at Stanley, Perthshire, Thomas Redpath Scott Sibbald, M.D. Edin., aged 67.

NOTES, COMMENTS AND ABSTRACTS

MARGARINE

IN the *Medical Press and Circular* of Jan. 10 Mr. R. Thomas, D.Sc., chief research chemist to Lever Brothers and Unilever Ltd., describes how margarine is made. Its fat is now almost entirely vegetable, being principally obtained from nut oils, though whale oil is used by some manufacturers, whereas in the original product it was derived from beef olein. Modern methods of refining, and the ease with which the melting point can be raised by hydrogenation, have made it possible to prepare a fat closely simulating butter fat in physical properties. This is emulsified with fresh skimmed milk, which after pasteurisation is inoculated with a pure lactic acid culture to give it the true butter flavour. During emulsification vitamins A and D are introduced in proportions similar to those in summer butter. The creamy emulsion is cooled by passing it over revolving steel drums whose surfaces are kept at −15° C., which converts it into a solid which cannot easily separate into its original oily and aqueous phases. In the maturing-room the temperature is allowed gradually to rise and the fats take up more of the flavour and aroma of the milk. Kneading and beating further improve the consistency of the now relatively soft and buttery emulsion, which is salted if desired, and is then ready for blending and for final examination as to water content (which by law must not exceed 16 per cent.) before it is packed and wrapped for sale.

Modern margarine is undoubtedly much more like butter, not merely in taste but in dietetic properties, than the earlier product and the addition of vitamins has removed one of its principal defects. According to the 1933 report of the nutrition committee of the B.M.A., the calorie value of margarine is about 2 per cent. higher than that of butter. Dr. Thomas refers to a tasting competition organised by a firm of margarine manufacturers in which only two out of several thousands correctly distinguished between a number of samples of margarine and butter, and even these two failed to do it a second time.

NEW BRAZILIAN JOURNAL

Medicina e Cirurgia is a quarterly review of the public-health service in Pôrto Alegre, a flourishing seaport in the state of Rio Grande del Sul. The first number is dated July–September, 1939, and contains a description of the proposed municipal hospital and of the public-health centre that is to be built by the town for the state. Among other contents are a long and profusely illustrated original article on diaphragmatic hernia, reports of two cases of hæmorrhagic diathesis and of two cases of cerebromeningeal hæmorrhage into the ventricles, reviews of current medical literature, and public-health statistics for Pôrto Alegre.

DYSENTERY IN POLAND

Prof. R. Gantenberg has contributed to the *Deutsche Medizinische Wochenschrift* for Dec. 15 and 22 a study of the behaviour of dysentery during the fighting in Poland in the latter half of 1939. More than a third of the cases admitted to his hospital for infectious diseases in Berlin were very severe, and there were several deaths within the first three days of admission. In 82 clinically definite cases, the results of the bacteriological examination were as follows: Shiga-Kruse, 32; Y, 12; A, 6; E, 2; bacteriologically negative, 30. The Shiga-Kruse cases were characterised by their severity and the frequency with which the bacilli were found; only in 1 such case, ending in death, did the bacteriological examination prove negative. Massive infection was the rule, the ulceration often extending far up into the small intestine.

In treatment, Professor Gantenberg recommends a diet of raw apples, in the natural state or freshly grated, for two to three days. Blood transfusion also proved valuable. Treatment with polyvalent and monovalent antitoxic dysentery serum should, he says, be instituted as early as possible. Bacteriophage treatment in 7 cases gave encouraging results, but the reactions and other incidents encountered suggest that it has not yet emerged from the experimental stage, and that a satisfactory technique has yet to be evolved. Professor Gantenberg expresses some misgivings concerning the extension of dysentery to the Western front; and since there is already evidence of the spread of the infection from Poland to Germany, he urges that the greatest care should be taken to track down carriers.

THE COLLAPSING BED

THE English are said to have a genius for improvisation and the standard army folding bed for use in emergency hospitals has apparently been designed to give full play to this gift. The legs are apt to collapse if the bed is tilted and the middle joint is weak, but struts and clamps have been devised to brace the legs and strengthen the hinge. It has no back-rest but some are on order. It has no foot board but four blocks, two of half height, are an admirable substitute. The legs have no castors and bite into the floor, but it is simple to file off their ends or place them in wooden cups. The bed cannot be moved with a patient in it, but an easily constructed wooden bed-lifter for this purpose has already been described in our columns (Dec. 9, 1939, p. 1224) and there are others such as a complete wooden rectangular frame upon which the bed rests. A final suggestion seems to be that where possible a standard hospital bed should be used in surgical and orthopædic wards and the army bed reserved for convalescent and walking cases. Indeed, Mr. Oliver Stanley, Secretary of State for War, was able to assure the House of Commons on Jan. 18 that the Chief of the Imperial General Staff has been using one himself and has "so far suffered no ill effects from it." The bed is said however to be cheap, easily transportable when folded, and to pack into a small space, and should be well suited for storing after the war is over.

THE WORKERS' LEISURE

WAR-TIME industrial production enlarges factories and therewith the duties of those who care for the health and well-being of the workers. What with evacuated wives, married women workers, long hours, and night shifts, "Canteens in Industry" (London: Industrial Welfare Society. 1939. Pp. 70. 1s.) makes a timely appearance. It has the virtue of being wholly practical, its chief aim being to give facts or channels of information from which facts can be obtained. It surveys comprehensively all aspects of the factory canteen, from the choice of a site to the disposal of refuse; and it explains difficulties of management, different types of service, profit, and legal conundrums. But the worker himself and his needs actually claim most of the writers' attention—the need for cheerful surroundings in the canteen, which may also be a rest and recreation room, and for different diets for various types of work and various ages. Besides the usual notes on food values there is a table of basic quantities which should be useful in planning meals with these factors in mind. Great care has been taken to ensure that the specimen menus really illustrate the points made in the chapter on food and diet. Throughout the book there is a note of intense enthusiasm. The writers urge that if the ideal equipment cannot be obtained, the canteen must be run without it, but their picture of what a canteen should be, with its tasteful decoration, dancing-floor, efficient service and well-treated servants, nourishing, cheap and appetising meals, and even a sun lounge, must make all who read the book unsatisfied with anything that falls short of the best.

SPITTING FIRE

J. A. C. writes: Your article on Frog in the Throat (*Lancet*, 1939, **2**, 461) appears to have been written in ignorance of the "Great Abbas," a famous music-hall performer. I saw him at the Chelsea Palace two or three years ago, attired as an Arab. In the course of his turn he swallowed at once 28 Barcelona nuts, in shell, which he proceeded to eject into a brass bowl with a truly amazing rattle. But his star turn was to swallow one to two pints of water followed by a pint of some form of petroleum. These he then expelled in a continuous stream. His female assistant next lit the petroleum at a distance. The fire thus started was apparently quenched by the water which followed from the performer's throat. He died about a year ago, but I don't think an autopsy was allowed. So his secret went with him.

NEW PREPARATIONS

PHRENAZOL is the brand name of a 10 per cent. solution of pentamethylenetetrazol containing 0·1 per cent. of sodium phosphate. It is introduced by Boots Pure Drug Co. Ltd., Nottingham, for use in the shock treatment of schizophrenia and as a cardiac and respiratory stimulant; for the former it is presented in 3 and 5 c.cm. ampoules and for the latter in 1 c.cm. ampoules.

ETHAMOLIN is a new sclerosing agent for use in the injection treatment of varicose veins. It is an aqueous solution of ethanolamine oleate (5 per cent.) with 2 per cent. of benzyl alcohol as a preservative. It is issued by Glaxo Laboratories Ltd., Greenford, Middlesex, in 15 c.cm. and 30 c.cm. rubber-capped bottles and in boxes containing six 2 c.cm. ampoules.

MORAMIN.—This new sclerosing fluid has been introduced by Allen and Hanburys Ltd. (Bethnal Green, London, E.2). This 5 per cent. sterile solution of ethanolamine morrhuate is claimed to be more active than the corresponding salts of the highly saturated fatty acids. It is presented in 20 c.cm. rubber-stoppered vials.

TABLOID THEOBA.—This addition to their tabloid range of products has been introduced by Burroughs Wellcome and Co. Each unit contains 5 grains of theobromine and half a grain of phenobarbitone. Tabloid Theoba is intended as a combined diuretic and sedative for use in hypersensitive heart, angina pectoris, and high blood-pressure; it dilates the coronary arteries and relaxes diseased arteries The presence of phenobarbitone in this product brings it within the first schedule of the Poisons Rules, 1935, and it may only be dispensed on a medical prescription.

ALLENBURY'S A B D CAPSULES.—The composition of these capsules is as follows: vitamin A, 2000 I.U.; vitamin D, 200 I.U.; vitamin B_1 100 I.U.; and vitamin B_2 40 Bourquin Sherman units, equivalent to 100 mg. riboflavin together with other factors of the vitamin-B complex including the P.P. factor—nicotinic acid—and the filtrate factor. The strength of the capsules, which are small and easily swallowed, is intended to give optimal dosage. They are meant to be a dietary supplement for children and adults. The makers are Allen and Hanburys Ltd., Bethnal Green, London, E.2.

TREATMENT OF BURNS AND SCALDS IN CHILDREN.—In his paper in our issue of Nov. 25 (p. 1108) Mr. Wallace M. Dennison stated that desoxycorticosterone acetate can be administered intravenously by adding it to the reservoir of the continuous-drip apparatus. He now informs us that this is not so, for D.O.C.A. and Percorten are oily, and it is Eucortone (A. and H.) and Cortine (Organon) which can be given in this way since these both dissolve in saline.

Messrs. ORGANON LABORATORIES, Ltd., are returning on Jan. 29 to their London headquarters at 77, Newman Street, London, W.1.

Appointments

BRIMELOW, KATHLEEN, M.B. Brist., D.P.H., assistant medical officer of health for maternity and child welfare for Bristol.
DENHOLM-YOUNG, HILDA M., M.B. Edin., temporary assistant school medical officer for Kent.
GILBERT, BARTON, M.D. Lond., F.R.C.S., M.R.C.O.G., surgeon to the Chelsea Hospital for Women.
GOLIGHER, J. C., M.B. Edin., F.R.C.S., house surgeon at St. Mark's Hospital, London.
HARRISON, KENT, M.D. Toronto, F.R.C.S., resident surgical officer at St. Mark's Hospital, London.
HUTTON, EFFIE L., M.D. Lond., D.P.M., clinical director to the Burden Neurological Institute, Stapleton, nr. Bristol.
LEIGHTON, S. R., M.D. Glasg., temporary assistant school medical officer for Kent.
LYE, BERYL PRIDEAUX, M.B. Glasg., F.R.C.S.E., assistant medical officer of health for Lincoln.
NICHOLSON, B. C., M.D. Camb., M.R.C.P., D.P.H., assistant medical officer for maternity and child welfare for Bristol.
OXLEY, C. E. S., M.R.C.S., D.L.O., visiting ear, nose and throat surgeon to the Royal Sea-bathing Hospital, Margate.
PINNOCK, D. D., M.B. Melb., F.R.C.S., temporary general surgeon to Worthing Hospital.
RAMAGE, GERALD, M.D. Manc., D.P.H., deputy county medical officer of health for Staffordshire.
ROSENBERG, HENRY, M.R.C.S., temporary anæsthetist to Worthing Hospital.

Vacancies

Banbury, Horton General Hosp.—Res. M.O., at rate of £150.
Barbados General Hosp.—Radiologist, £800.
Bedford County Hosp.—Second H.S., at rate of £150.
Birmingham City.—M.O. for maternity and child welfare dept., £500.
Birmingham United Hosp.—Registrar to ear, nose, and throat dept., £150.
Blackburn County Borough.—Res. jun. asst. M.O., at Queen's Park Hospital and Institution, £200.
Bradford Royal Infirmary.—H.S.'s, each at rate of £150. Also res. surg. O., £250.
Bristol General Hosp.—Temp. res. surg. O. and registrar, £200.
Bristol University.—Lecturer in dental prosthesis, £500. Also registrar, £400.
British Postgraduate Medical School, Ducane Road, W.12.—Temp. first asst. in surgical unit.
Cambridge, Addenbrooke's Hosp.—H.S., at rate of £130.
Canterbury, Kent and Canterbury Hosp.—H.S., £125.
Dagenham Borough.—Asst. M.O.H., £550.
Dorchester, Dorset County Hosp.—H.S., at rate of £150.
Ealing Borough.—Asst. M.O., £450.
Erith Borough.—M.O.H. and school M.O., £800.
Hostel of St. Luke, Fitzroy Sq., W.1.—Res. M.O., at rate of £200.
Liphook, Hants, King George's Sanatorium for Sailors.—Asst. M.O., at rate of £200.
Liverpool, City Infectious Diseases Hosp.—Res. asst. M.O.'s, each £250.
Liverpool Royal Children's Hosp., Myrtle Street.—Anæsthetist, £50.
London County Council.—Temp. asst. M.O.'s, £350 and £250.
London Homœopathic Hosp., Great Ormond Street, W.C.1.—H.P., at rate of £100.
London Jewish Hosp., Stepney Green, E.1.—Outpatient med. regr., honorarium £80.
Manchester, Ancoats Hosp.—Two H.S.'s, each at rate of £100.
Manchester Royal Children's Hosp., Pendlebury.—Res. surg. O., at rate of £150.
Manchester Royal Eye Hosp.—Jun. H.S., £120.
Margate, Royal Sea-Bathing Hosp.—H.S., at rate of £200.
Newcastle-upon-Tyne, Hosp. for Sick Children.—H.P. and two H.S.'s, each at rate of £100.
Oldham County Borough.—Dep. M.O.H. and asst. tuber. O. £750.
Oldham, Municipal Hosp.—Res. asst. M.O., at rate of £200.
Oxford, Wingfield-Morris Orthopædic Hosp., Headington.—Lord Nuffield scholarship in orthopædic surgery, £200.
Plymouth City General Hosp.—Temporary deputy med. supt., £450.
Portsmouth, Saint Mary's Hosp.—Jun. asst. res. M.O., £250.
Queen Mary's Hosp. for the East End, Stratford, E.15.—Cas. O., £150.
Royal Cancer Hosp., Fulham Road, S.W.3.—H.S., at rate of £100.
Royal Free Hosp., Gray's Inn Road, W.C.1.—Hon. obstet. surg., Hon. asst. obstet. surg. Also asst. med. reg., £200.
Royal London Ophthalmic Hosp., City Road, E.C.1.—First asst. M.O., £1 per session.
Royal National Orthopædic Hosp.—Res. surg. and med. supt., at rate of £1250.
Salisbury General Infirmary.—Res. M.O., £250.
Salvation Army, Mothers' Hosp., Lower Clapton Road, E.5.—Obstetric registrar. Also hon. clin. asst. in antenatal dept.
Sheffield Royal Infirm.—Clin. asst. to dermatological dept., £300.
Smethwick, St. Chad's Hosp.—H.S., at rate of £150.
Southampton Children's Hosp. and Dispensary for Women.—Res. M.O., at rate of £150.
Sunderland Royal Infirmary.—H.P., at rate of £120.
Swansea, Hill House Isolation Hosp.—Res. M.O., £200.
Wakefield, Clayton Hosp.—Orthopædic H.S. and jun. H.S., each £150.
Wandsworth Metropolitan Borough.—Temp. asst. M.O.H., and asst. tub. O., £600.
West Ham County Borough.—First asst. res. M.O., at Central Home, £525.
Wolverhampton and Midland Counties Eye Infirmary.—H.S., £150.
Wolverhampton Royal Hosp.—H.S., at rate of £100.

The Chief Inspector of Factories announces vacant appointments for examining surgeons at Cowdenbeath, Fife; Harrow, Middlesex; Withnell, Lancaster.